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**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

SCHEDULE 14A

Proxy Statement Pursuant to Section 14(a) of
the Securities Exchange Act of 1934 (Amendment No.)

Filed by the Registrant

Filed by a Party other than the Registrant

Check the appropriate box:

- Preliminary Proxy Statement
- Confidential, for Use of the Commission Only (as permitted by Rule 14a-6(e)(2))**
- Definitive Proxy Statement
- Definitive Additional Materials
- Soliciting Material under §240.14a-12

Axcelis Technologies, Inc.

(Name of Registrant as Specified In Its Charter)

(Name of Person(s) Filing Proxy Statement, if other than the Registrant)

Payment of Filing Fee (Check the appropriate box):

- No fee required.
- Fee computed on table below per Exchange Act Rules 14a-6(i)(1) and 0-11.
 - (1) Title of each class of securities to which transaction applies:

 - (2) Aggregate number of securities to which transaction applies:

 - (3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):

 - (4) Proposed maximum aggregate value of transaction:

 - (5) Total fee paid:

- Fee paid previously with preliminary materials.
- Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a)(2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.
 - (1) Amount Previously Paid:

 - (2) Form, Schedule or Registration Statement No.:

 - (3) Filing Party:

 - (4) Date Filed:



**NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
to Be Held May 2, 2012**

The 2012 annual meeting of the stockholders of Axcelis Technologies, Inc., a Delaware corporation, will be held at the offices of the Company at 108 Cherry Hill Drive, Beverly, Massachusetts, at 11:00 a.m. on Wednesday, May 2, 2012 for the following purposes:

1. To elect as directors the eight (8) nominees named in the attached proxy statement to serve until the 2013 annual meeting of stockholders.
2. To adopt the 2012 Equity Incentive Plan;
3. To ratify the appointment of our independent registered public accounting firm to audit our financial statements for the year ending December 31, 2012.
4. To approve the compensation of our named executive officers.
5. To transact such other business as may properly come before the meeting or any adjournment thereof.

Only stockholders of record at the close of business on March 5, 2012 will be entitled to vote at the annual meeting or at any adjournment. **It is important that your shares be represented at the meeting. Therefore, whether or not you plan to attend the meeting, please complete your proxy card and return it in the enclosed envelope, which requires no postage if mailed in the United States. If you attend the meeting and wish to vote in person, your proxy will not be used.**

By order of the Board of Directors,

A handwritten signature in black ink, appearing to read "Lynnette Fallon", written in a cursive style.

Lynnette C. Fallon,
Secretary

Dated: March 26, 2012

Directions to 108 Cherry Hill Drive, Beverly, MA

From Boston's Logan Airport: On leaving Boston's Logan Airport, take Route 1A north for 3 miles. Turn left onto Route 60 West for 2 miles. At the 2nd rotary, take Route 1 North for 6.6 miles. Exit onto Routes 95/128 North toward Gloucester.

From Route 128 North: Take Route 128 North to Exit 22 W. At bottom of exit ramp, take a right onto Route 62. Take your first right onto State Road, bear right at fork onto Conant Street. Follow Conant Street past the Cherry Hill Creamery on left and take a left onto Cherry Hill Drive. 108 Cherry Hill Drive is the first building on your right.

PROXY STATEMENT

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GENERAL INFORMATION ABOUT VOTING

The Board of Directors of Axcelis Technologies, Inc. ("Axcelis" or the "Company") is soliciting your proxy for use at the 2012 annual meeting of stockholders to be held on Tuesday, May 2, 2012 and at any adjournment of the meeting. This proxy statement and the accompanying proxy card are first being sent or given to stockholders of Axcelis on or about March 26, 2012. The meeting will be held at the Company's offices at 108 Cherry Hill Drive, Beverly MA. Driving directions are on the Notice accompanying this Proxy Statement.

Important Notice Regarding the Availability of Proxy Materials for the Shareholder Meeting to Be Held on May 2, 2012: This Proxy Statement and our Annual Report to Shareholders are available on our website at: www.axcelis.com/proxy.html.

Who can vote. You may vote your shares of Axcelis common stock at the annual meeting if you were a stockholder of record at the close of business on March 5, 2012. On that date, there were 107,137,038 shares of common stock outstanding. You are entitled to one vote for each share of common stock that you held on the record date.

How to vote your shares. You may vote either by proxy or by attending the meeting and voting in person. To vote by proxy, either (A) complete, sign, date and mail your proxy card or voting instruction form or (B) follow the instructions on the card or form for voting by telephone or on the Internet. If your shares are held by a nominee (e.g., a bank or broker), you must request a legal proxy from your nominee as proof of ownership in order to vote in person at the meeting.

The proxies named in the proxy card will vote your shares as you have instructed. If you sign and return the proxy card without indicating how your votes should be cast, the proxies will vote your shares in favor of each proposal, as recommended by our Board of Directors. Even if you plan to attend the meeting, please complete and mail your proxy card to ensure that your shares are represented at the meeting. If you attend the meeting, you can still revoke your proxy by voting in person. If your shares are held in a brokerage or bank account, you must make arrangements with your broker or bank to vote your shares in person.

Proposals to be considered at the annual meeting. The principal business expected to be transacted at the meeting, as more fully described below, will be the re-election of eight directors whose current terms end in 2012, the approval of the 2012 Equity Incentive Plan, the ratification of the selection of independent auditors of the Company and an advisory votes on executive compensation.

Quorum. A quorum of stockholders is required to transact business at the meeting. A majority of the outstanding shares of common stock entitled to vote, represented at the meeting in person or by proxy, constitutes a quorum for the transaction of business.

Number of votes required. The votes required to approve the proposals that are scheduled to be presented at the meeting are as follows:

<u>Proposal</u>	<u>Required Vote</u>
Election of eight nominees as directors	Each nominee must receive a plurality of the votes cast.
Approval of the 2012 Equity Incentive Plan	The proposal will be considered approved if more votes are cast in favor than against.
Ratification of the appointment of our independent registered public accounting firm (our "independent auditors") to audit our financial statements for 2012	The proposal will be considered approved if more votes are cast in favor than against.
Approval of the compensation of our named executive officers as described under "Executive Compensation" in this proxy statement.	This non-binding proposal will be considered approved if more votes are cast in favor than against.

Abstentions. Abstaining from voting for a nominee in the election of directors or on any of the other proposals will reduce the number of votes cast as well as the number of votes in favor so will have no impact on the results of voting.

Broker non-votes. A broker non-vote occurs when a broker cannot vote a customer's shares registered in the broker's name because the customer did not send the broker instructions on how to vote on the matter and the broker is barred by law or stock exchange regulations from exercising its discretionary voting authority in the particular matter. Brokers will have voting discretion for shares registered in their own name on the proposal to ratify the appointment of our independent auditors, but not in the election of directors or the other proposals. Broker non-votes will not be included in the votes cast, so will have no impact on the results of voting with respect to the election of directors and the other proposals.

Discretionary voting by proxies on other matters. Aside from the proposals for the election of directors, the approval of the 2012 Equity Incentive Plan, the ratification of our selection of auditors and the advisory vote on executive compensation, we do not know of any other proposals that may be presented at the 2012 annual meeting. If another matter is properly presented for consideration at the meeting, the persons named in the accompanying proxy card will exercise their discretion in voting on the matter.

How you may revoke your proxy. You may revoke the authority granted by your executed proxy card at any time before we exercise it by filing with our Corporate Secretary, Lynnette C. Fallon, a written revocation or a duly executed proxy card bearing a later date, or by voting in person at the meeting. If your shares are held in a brokerage account, you must make arrangements with your broker or bank to revoke your proxy.

Expenses of solicitation. We will bear all costs of soliciting proxies. We will upon request reimburse brokers, custodians and fiduciaries for out-of-pocket expenses incurred in forwarding proxy solicitation materials to the beneficial owners of stock held in their names. In addition to solicitations by mail, our directors, officers and employees may solicit proxies from stockholders in person or by other means of communication, including telephone, facsimile and e-mail, without additional remuneration. We may retain a proxy solicitation firm to assist in the solicitation of proxies. We will bear all reasonable fees and expenses if such a firm is retained.

Householding of Annual Meeting Materials. Some banks, brokers and other nominee record holders may be "householding" our proxy statements and annual reports. This means that only one copy of our proxy statement and annual report to stockholders may have been sent to multiple stockholders in your household. We will promptly deliver a separate copy of either document to you if you call or write us at the following address or telephone number: Axcelis Technologies, Inc., 108 Cherry Hill Drive, Beverly, Massachusetts 01915, Attn: Corporate Secretary, telephone: (978) 787-4000. If you want to receive separate copies of the proxy statement or annual report to stockholders in the future, or if you are receiving multiple copies and would like to receive only one copy per household, you should contact your bank, broker, or other nominee record holder, or you may contact us at the above address and telephone number. Our annual report is also available on our website at www.axcelis.com.

SHARE OWNERSHIP OF 5% STOCKHOLDERS

The following table shows the amount of our common stock beneficially owned as of December 31, 2011 by persons known by us to own more than 5% of our common stock.

<u>Beneficial Owner(1)</u>	<u>Shares Owned</u>	<u>Percent of Class</u>
Donald Smith & Co., Inc.(2) 152 West 57th Street, New York, NY 10019	10,988,793	10.31%
BlackRock, Inc.(3) 40 East 52 nd Street, New York, NY 10022	6,213,684	5.83%

- (1) Unless otherwise noted, the number of shares beneficially owned by each person listed includes any shares over which a person has sole or shared voting or investment power. The percentage ownership of each person listed in the table was calculated using the total number of shares outstanding on December 31, 2011 (106,667,996 shares).
- (2) Based on a Schedule 13G filed with the Securities and Exchange Commission in February 2012 reporting on ownership as of December 31, 2011, which states that such shares are owned by advisory clients of Donald Smith & Co., Inc. According to the Schedule 13G, Donald Smith & Co., Inc. has sole voting power over 8,368,000 of such shares and the sole power to dispose of all of such shares. According to the Schedule 13G, Donald Smith Value Fund, L.P., Donald Smith Long/Short Equities Fund, L.P. and Velin Mezinev each have sole dispositive power over all the shares reported in the table and sole voting power over 287,600, 80,893, and 21,300 of such shares, respectively.
- (3) Based on a Schedule 13G/A filed with the Securities and Exchange Commission in February 2012 reporting on ownership as of December 31, 2011. This filing states that BlackRock, Inc. is a holding company whose investment management subsidiaries acquired the shares reported.

SHARE OWNERSHIP OF DIRECTORS AND EXECUTIVE OFFICERS

The following table shows the amount of our common stock beneficially owned as of March 5, 2012 by our directors, the executive officers named in the Summary Compensation Table below, and all of our current executive officers and directors as a group.

<u>Beneficial Owner(1)</u>	<u>Shares Owned</u>	<u>Shares Subject to Exercisable Rights to Acquire as of May 4, 2012</u>	<u>Total Shares Beneficially Owned</u>	<u>Percent of Class</u>
<i>Non-Executive Directors</i>				
Edward H. Braun	—	80,000	80,000	*
R. John Fletcher	79,185	195,000	274,185	*
Stephen R. Hardis	597,920	135,000	732,920	*
William C. Jennings	77,185	195,000	272,185	*
Joseph P. Keithley	10,000	40,000	50,000	*
Patrick H. Nettles	63,685	185,000	248,685	*
H. Brian Thompson	84,185	185,000	269,185	*
<i>Named Executive Officers (Current)</i>				
Mary G. Puma(2)	300,452	837,500	1,137,952	1.05%
Jay Zager	18,532	50,000	68,532	*
Lynnette C. Fallon	113,366	273,750	387,116	*
Kevin J. Brewer	90,047	179,286	269,333	*
<i>Named Executive Officers (Former)</i>				
Stephen G. Bassett(3)	101,305	80,000	181,305	*
Matthew P. Flynn(4)	39,688	473,000	512,688	*
<i>All current Executive Officers and Directors as a Group (12 persons)(5)</i>				
	1,475,871	2,465,036	3,940,907	3.61%

* Indicates less than 1%.

- (1) Unless otherwise noted, the number of shares beneficially owned by each person listed includes any shares over which the person has sole or shared voting or investment power. The shares shown in the table also include shares that the persons named in this table have the right to acquire on or before May 4, 2012 (60 days after March 5, 2012) by exercising a stock option or other right. Unless otherwise noted, each person has sole investment and voting power (or shares that power with his or her spouse) over the shares listed in the table. The percentage ownership of each person listed in the table was calculated using the total number of shares outstanding on March 5, 2012 (107,137,038 shares), plus any shares that person could acquire upon the exercise of any options or other rights on or before May 4, 2012.
- (2) Ms. Puma's ownership includes 20,000 shares owned by her husband.
- (3) During 2011, Mr. Bassett served as Chief Financial Officer from the beginning of the year until January 17, 2011.
- (4) Mr. Flynn resigned as an executive officer on February 24, 2012.
- (5) Includes shares and exercisable options held by the directors and current named executive officers, as well as one other current executive officer who beneficially owns 41,314 shares and 109,500 exercisable options.

PROPOSAL 1: ELECTION OF DIRECTORS

Our Board of Directors has fixed the number of directors at eight. The number of directors is subject to increase or decrease by action of the Board. At the 2012 annual meeting, all eight directors will be elected to hold office for a term of one year until our annual meeting in 2013 and until their successors are elected and qualified. Each of the Board's nominees has consented to serve if elected. However, if any nominee is unable to serve, proxies will be voted for any other candidate nominated by the Board. The Board recommends a vote FOR each of the eight nominees.

The following table contains biographical information about the nominees for director and current directors whose term of office will continue after the meeting.

<u>Name and Age</u>	<u>Business Experience and Other Directorships</u>	<u>Director Since</u>
Edward H. Braun Age: 71	Edward H. Braun is Chairman of Veeco Instruments, Inc., a maker of equipment to manufacture LEDs, solar panels, hard disk drives and other devices, a position he has held since 1990. Until July 2007, Mr. Braun was also Chief Executive Officer of Veeco. Prior to 1990, Mr. Braun held numerous executive positions, beginning in 1966, at a company acquired by Veeco in 1990. Mr. Braun is a Director Emeritus of Semiconductor Equipment and Materials International (SEMI), a trade association, of which he was Chairman of the Board in 1993, and is a director of Cymer, Inc., a supplier of excimer laser light sources used in deep ultra-violet photolithography systems.	2011
R. John Fletcher Age: 66	Mr. Fletcher is Chief Executive Officer of Fletcher Spaght, Inc., a strategy consulting organization, which he founded in 1983, and Managing Director of Fletcher Spaght Ventures, a venture capital fund. Prior to founding Fletcher Spaght, Inc., Mr. Fletcher was a Manager at the Boston Consulting Group. Mr. Fletcher is also a director of The Spectranetics Corporation and Marina Biotech, Inc. During the past five years, he was also a director of AutoImmune, Inc. and Panacos, Inc.	2003
Stephen R. Hardis Age: 76	Mr. Hardis was the Company's Chairman of the Board until May 2006 and currently serves as Lead Director. He was Chairman and Chief Executive Officer of Eaton Corporation, a global industrial manufacturer, until July 2000. Mr. Hardis became Eaton's Chairman in January 1996 and its Chief Executive Officer in September 1995. Prior to that, he served as Eaton's Vice Chairman from 1986 and its Executive Vice President—Finance and Administration from 1979. Mr. Hardis is a director of Lexmark International Group, Inc., and Progressive Corporation, and during the past five years, he was also a director of Marsh & McLennan Companies, Inc., American Greetings Corporation, Nordson Corporation, and Steris Corporation.	2000

<u>Name and Age</u>	<u>Business Experience and Other Directorships</u>	<u>Director Since</u>
William C. Jennings Age: 72	Mr. Jennings is a retired partner of PricewaterhouseCoopers LLP, a global accounting and advisory firm, where he led the risk management and internal control consulting practice from 1992 until his retirement in 1999. Before that, Mr. Jennings served as a senior audit partner at Coopers & Lybrand, as a senior executive vice president at Shearson Lehman Brothers, responsible for quality assurance, internal audit and compliance, and as an executive vice president and chief financial officer of Bankers Trust. Since retiring from PricewaterhouseCoopers, Mr. Jennings has provided independent consulting services to a number of companies. He is a director of Silgan Holdings Inc., and The Spectranetics Corporation, and during the past five years, he was also a director of Nyfix, Inc.	2003
Joseph P. Keithley Age: 63	Mr. Keithley is Non-Executive Chairman of the Board of Nordson Corporation, a position he has held since February 2010. Nordson Corporation manufactures precision dispensing equipment for applying industrial liquid and powder coatings, adhesives, and sealants. Mr. Keithley has served as Chairman of the Board of Keithley Instruments, Inc., a provider of measurement solutions to the semiconductor, fiber optics, telecommunications and electronics industries from 1991 to December 2010. He also served as Keithley Instruments, Inc.'s Chief Executive Officer from November 1993 to December 2010 and as President from May 1994 to December 2010. Mr. Keithley currently serves as a director of Materion, Inc., an integrated producer of high performance specialty engineered materials used in a variety of electrical, electronic, thermal and structural applications.	2011
Patrick H. Nettles Age: 68	Mr. Nettles has served as Executive Chairman of the Board of Directors of CIENA Corporation, a manufacturer of optical networking equipment, since May 2001. Prior to that, Mr. Nettles served as Chairman of the Board of Directors and Chief Executive Officer of CIENA from October 2000, as its President, Chief Executive Officer and Director from April 1994, and as its Director and Chief Executive Officer from February 1994. Mr. Nettles is a director of Progressive Corporation.	2001
Mary G. Puma Age: 54	Ms. Puma is Axcelis' Chairman (since May 2006), Chief Executive Officer (since January 2002) and President (since May 2000). Prior to becoming Chief Executive Officer, Ms. Puma served as Chief Operating Officer from May 2000, and, before that, served as a Vice President of the Company from February 1999. In 1998, she became General Manager and Vice President of the Implant Systems Division of Eaton Corporation, a global diversified industrial manufacturer. In May 1996, she joined Eaton as General Manager of the Commercial Controls Division. Prior to joining Eaton, Ms. Puma spent 15 years in various marketing and general management positions for General Electric Company. Ms. Puma is also a director of Nordson Corporation and of Semiconductor Equipment and Materials International (SEMI), a trade association.	2000

<u>Name and Age</u>	<u>Business Experience and Other Directorships</u>	<u>Director Since</u>
H. Brian Thompson Age: 72	Mr. Thompson is Executive Chairman of Global Telecom & Technology (GTT), a global telecommunications carrier and network integrator. Mr. Thompson continues to head his own private equity investment and advisory firm, Universal Telecommunications, Inc. From December 2002 to June 2007, Mr. Thompson was Chairman of Comsat International and served as Chairman and Chief Executive Officer of Global TeleSystems Group, Inc. from March 1999 through September of 2000. Mr. Thompson was Chairman and CEO of LCI International from 1991 until its merger with Qwest Communications International Inc. in June 1998. He became Vice Chairman of the board for Qwest until his resignation in December 1998. He previously served as Executive Vice President of MCI Communications Corporation from 1981 to 1990, and prior to MCI, was a management consultant with the Washington, DC offices of McKinsey & Company for nine years, where he specialized in the management of telecommunications. He currently serves as a member of the board of directors of Pendrell Corporation, Penske Automotive Group, and Sonus Networks, Inc., and during the past five years he was also a director of Mercator Partners Acquisition Corporation and Bell Canada International, Inc.	2002

Experience, Qualifications Attributes of the Nominees and Continuing Directors

The specific experience, qualifications, attributes or skills of the nominees, as well as the other directors continuing in office, that led to the conclusion that each of these individuals should serve as a director of the Company, in light of our business and structure, are:

- Mr. Braun's work experience is very relevant to the issues addressed by Axcelis management relating to customer requirements for capital equipment for the semiconductor and other adjacent industries, such as solar and LED. Mr. Braun's work as a chief executive officer of Veeco has exposed him to issues relating to complex manufacturing, world-wide capital equipment markets and global outsourcing as well as business development and finance matters. Mr. Braun has served on the Nominating and Governance Committee since April 2011.
- Mr. Fletcher's work experience gives him extensive experience in strategic planning, especially in the area of market analysis for technology-based businesses, which has been beneficial to the Board's understanding of the Company's business opportunities. Mr. Fletcher's work also provides him with insight into capital formation matters which may be beneficial in the future. Mr. Fletcher has served on the Compensation Committee since May 2006 and on the Audit Committee since April 2004. The Board highly values his contributions in these roles.
- Mr. Hardis' work experience as a chief executive officer and chief financial officer of a global capital equipment business gives him the skills to provide leadership and guidance to management and the other Board members with respect to financial and operational matters affecting Axcelis. In addition, Mr. Hardis' experience on other public company boards of directors has exposed him to broad experience in corporate governance matters that has benefited our board. Finally, Mr. Hardis' experience with our business when it was owned by Eaton Corporation has provided our Board with a historical context in which to address issues relating to our business and products. Mr. Hardis has served as Lead Director since May 2006 (prior to which he was Chairman beginning in 2000), and also serves on both the Compensation

Committee and Nominating and Governance Committee since those committees were formed in 2000 and 2002, respectively. The Board highly values his contributions in these roles.

- Mr. Jennings' work experience in accounting, risk management and internal controls gives him the skills needed to lead the Board's audit committee, which he has done since joining the Board in 2003. His role as a senior executive at two financial institutions also gives him the skills to provide leadership and guidance to management and the other Board members in respect to the financial and operational matters affecting Axcelis. Mr. Jennings has served as chairman of the Board's Audit Committee since April 2004 and as a member since June 2003 and the Board has benefited from his strong leadership in that area.
- Mr. Keithley brings extensive, broad-based international business and executive management and leadership experience from his leadership roles at Keithley Instruments, Inc. to his role as a member of our Board of Directors. Among other things, Mr. Keithley draws upon his extensive knowledge in the global semiconductor and electronics industries garnered while leading Keithley Instruments, Inc. Mr. Keithley also has extensive public company board and governance experience. Mr. Keithley has served as a member of the Audit Committee since joining the Board in 2011 and the Board has benefited from his continuing service on that committee.
- Mr. Nettles' work experience as a chief executive officer and chief financial officer of a global capital equipment business gives him the skills to provide leadership and guidance to management and the other Board members in respect to the financial and operational matters affecting Axcelis. Mr. Nettles has also had meaningful experience in corporate transactions, especially in the area of mergers and acquisitions, which has been helpful to management and the other Board members in recent years and may be beneficial in the future. Mr. Nettles has served as chairman of the Board's Nominating and Governance Committee since its formation in 2002 and the Board has benefited from his strong leadership in that area.
- Ms. Puma's long experience in our industry, as well as her role as Axcelis' chief executive officer and president allow her to provide essential insight into the Company's past and current business operations which is critical to the Board's decision-making in all financial and operational matters affecting Axcelis. Ms. Puma's strong leadership during challenging periods of the Company's history, notably her oversight of a complete revitalization of the Company's product lines while implementing substantial cost reductions, have been highly valued by the Board.
- Mr. Thompson's work experience leading a number of companies in the telecom industry gives him the skills to provide leadership and guidance to management and the other Board members in respect to the financial and operational matters affecting Axcelis. Mr. Thompson has also had significant experience in corporate transactions, especially in the capital markets, which has been helpful to management and the other Board members in recent years and may be beneficial in the future. Mr. Thompson has served as chairman of the Board's Compensation Committee since October 2002 and the Board has benefited from his strong leadership in that area.

PROPOSAL 2: APPROVAL OF THE 2012 EQUITY INCENTIVE PLAN

At the 2012 Annual Meeting, our shareholders will be asked to approve the adoption of the Axcelis Technologies, Inc. 2012 Equity Incentive Plan, which was adopted by the Board of Directors on February 9, 2012, and recommended to the shareholders for their consideration (the "New Plan"). As described below under "Tax Consequences to the Company," shareholder approval of the New Plan is also intended to qualify certain awards granted under the New Plan as "performance-based compensation" under Section 162(m) of the Internal Revenue Code ("IRC"), which would provide us favorable tax treatment for those awards.

The Board of Directors recommends that shareholders vote "For" Proposal No. 2.

Background

Equity awards are an important component of Axcelis' employee and director compensation offerings. The Company has had one equity award plan in effect since its initial public offering in 2000, known as the 2000 Stock Plan (the "Old Plan"). If approved by shareholders at the 2012 Annual Meeting, the New Plan will replace the Old Plan for all future equity awards. Awards previously granted under the Old Plan will continue to be subject to the terms of the Old Plan and agreements evidencing such awards. The material terms of the New Plan are summarized below.

Summary of the New Plan

The following is a brief description of the material features of the New Plan, as amended, and is qualified in its entirety by reference to the terms of the New Plan. Shareholders may obtain a copy of the New Plan upon written request to the Secretary of the Company.

Objective. The objective of the New Plan is to foster and promote the long-term growth and performance of the Company by enhancing our ability to attract and retain qualified employees and directors and by motivating employees and directors through stock ownership and performance-based incentives.

Eligibility. All employees and consultants of Axcelis and its subsidiaries, and all directors of Axcelis, are eligible to participate in the New Plan. Participants are selected by the Compensation Committee of our Board of Directors in its discretion. At December 31, 2011, the Company had 1,023 employees, and 7 non-employee directors.

Administration of the New Plan; Authority of Committee. The New Plan will be administered by the Compensation Committee or other committee appointed by the Board. The Compensation Committee has authority to: select the participants who will receive awards, grant awards, determine the terms, conditions, and restrictions applicable to the awards, determine how any exercise price is paid, modify or replace outstanding awards within the limits of the New Plan, accelerate the date on which awards become exercisable, waive the restrictions and conditions applicable to awards, and establish rules governing the New Plan, including special rules applicable to awards made to employees who are foreign nationals or are employed outside the United States. Subject to specific limitations under the Plan, as discussed below, the Compensation Committee is given the broad authority to establish these terms in order best to achieve the purpose of the New Plan. The Compensation Committee may also assume awards granted by an organization acquired by the Company or may grant awards in replacement of any such awards.

Types of Awards. The New Plan provides for the grant of stock options (incentive stock options or "non-qualified" stock options), restricted stock, restricted stock units, stock appreciation rights, awards of common stock that are not subject to restrictions or forfeiture, and stock equivalent awards. These

awards are payable in cash or common shares, or any combination thereof, as established by the Compensation Committee.

Plan Limitations on Award Terms. The New Plan establishes certain limits on the terms of awards granted under the New Plan:

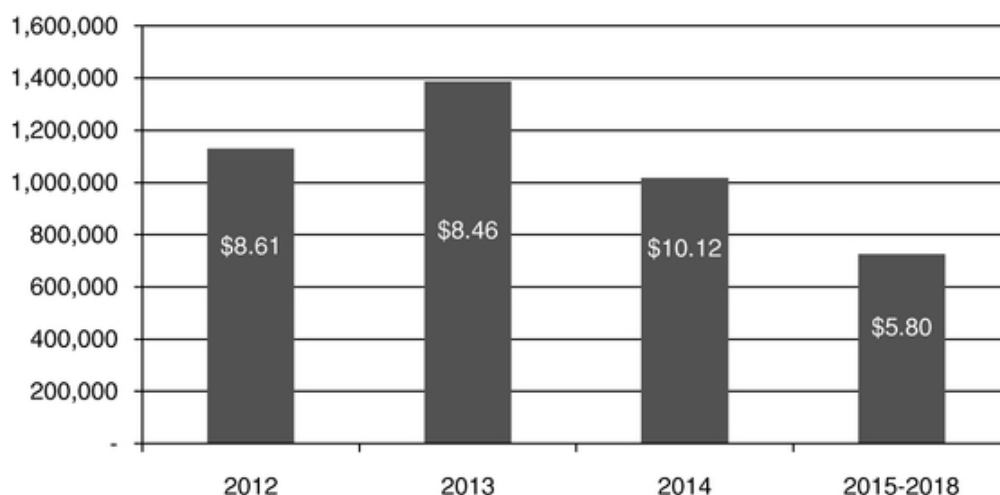
- The exercise price of options and stock appreciation rights granted under the New Plan must be not less than the fair market value of the common stock on the date of grant.
- The term of options and stock appreciation rights granted under the New Plan may not exceed seven years.
- In the case of awards granted to the Company's executive officers, the vesting, settlement or lapse of forfeiture restrictions solely based on continued employment, service or the passage of time must (with certain exceptions) occur (i) with respect to no more than $\frac{1}{3}$ of the shares subject to the award in any one year, and (ii) over not less than four years from the date of grant for all shares subject to the award.
- Awards granted under the New Plan must be designed and administered in such a manner that they are either exempt from the application of, or comply with, the requirements of Section 409A of the IRC, which relates to the deferral of compensation for tax purposes.
- The New Plan prohibits the Committee, without obtaining stockholder approval, from amending any outstanding option or stock appreciation right to reduce the exercise price or canceling and replacing an option or stock appreciation right with an award exercisable for common stock at a lower exercise price.
- In order to comply with the exemption from Section 162(m) of the IRC relating to performance-based compensation, no participant may be granted stock options and stock appreciation rights, in the aggregate, for more than 1,250,000 shares during any fiscal year, and no performance-based award settled in cash may pay a participant more than \$1,000,000 in any one year.

Number of Common Shares. The maximum number of shares of common stock that may be issued upon exercise of awards under the New Plan is 6,000,000. The fair market value of our common shares as reported on the NASDAQ Global Select market on March 5, 2012 was \$1.57 per share. Shares issued under the New Plan may be either newly issued shares or treasury shares. The following provisions apply to determining how the available shares under the New Plan are deemed to be used:

- Each share subject to an award under the New Plan other than options and stock appreciation rights shall be counted as 1.5 shares;
- Shares subject to an award granted under the Old Plan or the New Plan that is forfeited, terminated, or canceled without having been exercised will become available for grant under the New Plan, subject to certain exceptions relating to incentive stock options;
- Shares subject to awards granted under the New Plan on assumption of, or substitution for, equity awards of a company acquired by Axcelis will not count against the share reserve under the New Plan; and
- Outstanding shares used to pay the exercise price of an option or stock appreciation right or shares which are withheld by the Company to satisfy the exercise price or tax withholding due on exercise or vesting may not be netted out against the shares issued on an award granted under the New Plan.

Expiration of Outstanding Underwater Stock Options Granted Under the Old Plan. As of December 31, 2011, approximately 21.1 million shares were issuable on exercise of outstanding options granted under the Old Plan. Of these, 4.26 million are expected to expire unexercised over the coming

years due to the high exercise prices on such options. The chart below sets forth the number of outstanding options expiring in each of the seven years following 2011, together with the weighted average price of the options expiring in each year, or group of years, in the case of 2015 to 2018. Whether or not these options expire unexercised will depend on various factors, principally the market price of our common stock during the period prior to expiration.



Performance Objectives for Performance-Based Compensation. The New Plan provides that, when so determined by the Compensation Committee, awards may specify performance objectives that, if achieved, will result in vesting, exercisability or the lapse of restrictions on awards. Awards with performance objectives are intended to satisfy the requirements for "performance-based compensation" under Section 162(m) of the IRC. Such grants should specify one or more objective performance goals and the effect of achieving the goal at or above a specified level for or within a requisite period or at a requisite date. For purposes of Section 162(m), the Compensation Committee must establish any performance goal near the beginning of any performance period and at a time when the outcome of the goals is substantially uncertain, and it must certify that the goal was achieved before the award is paid. Performance objectives may be based on any of the following criteria: revenue; revenue growth; sales; expenses; margins; net income; earnings or earnings per share; cash flow; stock price; shareholder return; return on investment; return on invested capital, assets, or equity; profit before or after tax; operating profit; operating margin; return on research and development investment; market capitalization; quality improvements; market share; cycle time reductions; customer satisfaction measures; strategic positioning or marketing programs; market penetration or expansion; business / information systems improvements; expense management; infrastructure support programs; human resource programs; customer programs; technology development programs; goals relating to acquisitions or divestitures, or any combination of the foregoing, including without limitation goals based on any of such measures relative to peer groups or market indices, and may be particular to an award recipient or may be based, in whole or in part, on the performance of the division, department, line of business, subsidiary, or other business unit, whether or not legally constituted, in which the award recipient works or on the performance of the Company generally.

Taxes Associated with Awards. Prior to the payment of an award, the Company may withhold, or require a participant to remit, an amount sufficient to pay any required Federal, state, and local taxes associated with the award. The Compensation Committee may permit participants to pay the required withholding taxes associated with an award in cash, by the transfer of common shares, by the surrender of all or part of an award (including the award being exercised), or by a combination of these methods.

Extraordinary Events. In the event of a recapitalization, stock dividend, stock split, other distribution to shareholders (other than normal cash dividends), or similar transaction, the Compensation Committee will adjust the number and class of shares that may be issued under the New Plan (including the number of shares that may be subject to awards granted to a participant in any fiscal year) and the number and class of shares, and the exercise price, applicable to outstanding awards. Similar adjustments may be made in the event of reorganization, merger, spin-off or other corporate transaction affecting the common stock where an adjustment is required in order to preserve the benefits intended to be provided by the plan. If considered appropriate, the Committee may make provision for a cash payment with respect to all or part of an outstanding award instead of or in addition to any such adjustment.

In the event of a corporate transaction in which a company other than Axcelis is the surviving, continuing, successor purchasing entity, outstanding awards may be assumed by such other company or may be exchanged for substituted awards from such other company. The terms of such assumed or substituted awards shall be appropriate in light of (A) the consideration received by the Company's stockholders in the transaction and (B) the terms of the outstanding awards. Awards outstanding under the New Plan which are not assumed or exchanged shall terminate on such terms as the Committee may determine. Notwithstanding the foregoing, if in such a transaction the stockholders of the Company receive consideration that is predominantly cash, then either (A) any vesting or lapse of forfeiture provisions on outstanding awards under the New Plan shall accelerate on the closing of the transaction and the award holder may share in the transaction consideration or (B) such awards shall be compensated through a separate payment in an amount that the award holder would have received in the transaction assuming such acceleration, as determined by the Compensation Committee.

Nonassignability of Awards. No award granted under the New Plan may be transferred or assigned by a participant or eligible transferee except on such terms as the Compensation Committee determines, and incentive stock options may be transferred only to the extent permitted by the Internal Revenue Code.

Amendment or Termination of the New Plan. The Board of Directors may amend, suspend, or terminate the New Plan at any time, subject to stockholder approval as needed to comply with tax or regulatory requirements.

Summary of U.S. Federal Income Tax Consequences of Awards

The following is a brief summary of certain consequences under current U.S. federal income tax law of certain transactions under the New Plan. This summary is not intended to be complete and does not describe state, local, foreign or other tax consequences.

Incentive Stock Options. In general, an employee will not recognize taxable income at the time an incentive stock option is granted or exercised. However, the excess of the fair market value of the common shares acquired upon exercise over the exercise price is potentially subject to the alternative minimum tax. If the option is not exercised by a specified date after termination of the holder's employment, the income tax treatment will be the same as that for a non-qualified stock option, described below. Upon disposition of the common shares acquired upon exercise, capital gain or capital loss will be recognized in an amount equal to the difference between the sale price and the exercise price, so long as minimum holding period requirements are satisfied. If the holding period requirements are not satisfied, the employee will recognize ordinary income upon disposition of the shares equal to the difference between the exercise price and the lesser of the fair market value of the common shares on the date the option is exercised or the amount realized in the disposition. Any remaining gain or loss is treated as a capital gain or capital loss.

Non-Qualified Stock Options. In general, a participant will not recognize taxable income upon the grant of a stock option that does not qualify as an incentive stock option (a "non-qualified stock option"). Upon exercise, the participant will recognize ordinary income in an amount equal to the difference between the exercise price and the fair market value of the common shares acquired upon exercise. Upon disposition of the common shares, appreciation or depreciation after the date of exercise will be treated as either capital gain or capital loss.

Restricted Stock Units. The participant will recognize no income at the time restricted stock units are awarded to the participant. When shares are issued on the vesting of restricted stock units, the participant will recognize compensation income equal to the excess of the fair market value of the vested shares stock at that time over the amount, if any, paid by the participant for the shares. Upon disposition of shares after issuance, any gain or loss realized by a participant will be treated as capital gain or loss.

Restricted Stock. Unless a participant makes an election under Section 83(b) of the IRC, the participant will recognize no income at the time restricted stock is awarded to the participant. When the restrictions lapse or are otherwise removed, the participant will recognize compensation income equal to the excess of the fair market value of the restricted stock at that time over the amount, if any, paid by the participant for the restricted stock. Dividends paid on restricted stock during any restriction period will, unless the participant has made an election under Section 83(b) of the IRC, constitute compensation income. Upon disposition of common shares after the restrictions lapse or are otherwise removed, any gain or loss realized by a participant will be treated as capital gain or loss. If a participant makes an election under Section 83(b) of the IRC, the participant will recognize compensation income equal to the excess of the fair market value of the common shares on the date of grant over the price paid for those common shares. Dividends paid on the stock thereafter will be treated as dividends taxable to the participant.

Stock Appreciation Rights and Stock Equivalents. The grant of stock appreciation rights and stock equivalents will have no immediate tax consequences to the participant receiving the grant. The amount received by the participant upon the exercise of the stock appreciation rights or stock equivalent will be included in the participant's ordinary income in the taxable year in which award is exercised or vested.

Parachute Payment Tax. The value of any accelerated vesting or exercisability of options or stock appreciation rights, or any accelerated lapse of restrictions on restricted stock or restricted stock units, in connection with a change in control of the Company will be taken into account in determining whether the participant is deemed to have received an "excess parachute payment" under Section 280G of the IRC. This may subject the participant to an excise tax.

Tax Consequences to the Company. To the extent that a participant recognizes ordinary income in the circumstances described above, the Company or the subsidiary for which the participant performs services will be entitled to a corresponding tax deduction provided that, among other things, (a) the income meets the test of reasonableness, (b) is an ordinary and necessary business expense, (c) is not an "excess parachute payment" and (d) is not disallowed by the \$1 million limitation on certain executive compensation under Section 162(m) of the IRC.

Under Section 162(m), the Company's federal income tax deductions may be limited to the extent total annual compensation in excess of \$1,000,000 is paid to any of our principal executive officer and our other three most highly compensated executive officers, other than our principal financial officer. However, deductions for certain "performance based compensation" are exempted from this limitation. The New Plan has been structured with the intention that compensation resulting from stock options, stock appreciation rights and other stock or cash performance-based awards granted under the New Plan in compliance with Section 162(m) would qualify as performance-based compensation, and if the New Plan is approved by our shareholders, would be deductible without regard to the limitations

imposed by Section 162(m). However, nothing in this proposal precludes the Committee from granting awards that do not qualify for tax deductibility under Section 162(m).

Plan Benefits

The benefits or amounts that will be received in the future under the New Plan by named executive officers, executive officers as a group, and all current non-employee directors or employees who are not executive officers as a group is not determinable because grants are subject to the discretion of the Compensation Committee. However, unvested or unexercised awards granted during fiscal 2011 under the Old Plan to the named executive officers and our directors are set forth in the tables entitled "Grants of Plan Based Awards During Fiscal Year 2011" and "Director Compensation During Fiscal 2011," respectively, elsewhere in this proxy statement.

Current Equity Compensation Plan Information

We maintain two equity compensation plans, the 2000 Stock Plan and the Employee Stock Purchase Plan. The number of shares issuable upon exercise of outstanding options and unvested restricted stock units granted to employees and non-employee directors, as well as the number of shares remaining available for future issuance, under our equity compensation plans as of December 31, 2011 are summarized in the following table:

<u>Plan category</u>	(A) Number of shares to be issued upon exercise of outstanding options, warrants and rights(1)	(B) Weighted-average exercise price of outstanding options, warrants and rights	(C) Number of shares remaining available for future issuance under equity compensation plans (excluding shares reflected in column (A))(2)
Equity compensation plans approved by stockholders	21,244,352	\$ 2.75	9,663,316
Equity compensation plans not approved by stockholders	—	—	—
Total	21,244,352	\$ 2.75	9,663,316

- (1) Represents 21,093,022 shares issuable on exercise of outstanding options as of December 31, 2011, plus 151,330 shares issuable on vesting of outstanding restricted stock units as of December 31, 2011 (some of which will be withheld to compensate for tax withholding).
- (2) Represents the total shares available for issuance under our 2000 Stock Plan and our Employee Stock Purchase Plan, as of December 31, 2011, as follows:
 - (A) 7,318,082 shares were available for future issuance under the 2000 Stock Plan. Such amount represents the total number of shares reserved for issuance under the 2000 Stock Plan (33,173,367), less 418,880 outstanding shares issued under the plan as restricted stock, 1,879,176 shares issued on vesting of outstanding restricted stock units, 2,312,877 shares issued upon option exercises, and the outstanding options and unvested restricted stock units shown in column (A), all as of December 31, 2011. This plan is generally used for grants to employees and directors and was approved by our stockholders at our 2002 annual meeting.
 - (B) 2,345,234 shares were available under our Employee Stock Purchase Plan, which represents the total number of shares reserved for issuance under the plan (7,500,000) less 5,154,765 shares issued through December 31, 2011.

PROPOSAL 3: RATIFICATION OF THE APPOINTMENT OF OUR INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Upon the recommendation of its Audit Committee, the Board of Directors has appointed the independent registered public accounting firm of Ernst & Young LLP as independent auditors to conduct the annual audit of our financial statements for 2012 and is seeking stockholder ratification of the appointment. Ernst & Young LLP is an internationally recognized independent registered public accounting firm that audited the Company's financial statements in 2011 and which the Audit Committee believes is well qualified to continue.

Representatives of Ernst & Young are expected to attend the annual meeting and be available to respond to appropriate questions. They will also have the opportunity to make a statement if they desire.

The aggregate fees billed for each of the last two fiscal years for professional services rendered by Ernst & Young LLP were as follows:

	<u>2010</u>	<u>2011</u>
Audit Fees	\$ 1,361,500	\$ 1,271,000
Audit Related Fees	\$ 19,500	\$ 39,500
Tax Fees		
Tax compliance and preparation of returns	\$ 156,378	\$ 141,000
International tax planning	\$ 89,379	\$ 85,000
General tax planning and other tax services	\$ 105,000	\$ 90,000
Total Tax Fees	<u>\$ 350,757</u>	<u>\$ 316,000</u>
Total Fees	<u>\$ 1,731,757</u>	<u>\$ 1,626,500</u>

Audit fees include statutory audits for subsidiaries and branches operating in countries outside of the United States. Audit related fees include the audit for the Company's 401(k) plan required under ERISA. International tax planning relates to the setting of fair compensation for services provided to us by our foreign subsidiaries to ensure appropriate revenue levels are reported for taxation in those foreign countries.

Under the Audit Committee's charter, the Audit Committee must pre-approve the fees to be paid to the independent auditor for audit services. In addition, the Audit Committee has adopted a policy requiring the Committee's pre-approval of all audit-related or non-audit (including tax) services performed by the independent auditor in order to assure that these services do not impair the auditor's independence. The policy prohibits the independent auditor's performance of certain types of services as inconsistent with independence.

Any approval required under the policy must be given by the Audit Committee or by any member or members to whom the Committee has delegated that authority. The Audit Committee does not delegate its responsibility to approve services performed by the independent auditor to any member of management.

The standard applied by the Audit Committee in determining whether to grant approval of any type of non-audit service, or of any specific engagement to perform a non-audit service, is whether the services to be performed, the compensation to be paid therefor and other related factors are consistent with the independent auditor's independence under guidelines of the Securities and Exchange Commission, the Public Company Accounting Oversight Board and applicable professional standards. Relevant considerations include whether the work product is likely to be subject to, or implicated in, audit procedures during the audit of our financial statements, whether the independent auditor would be functioning in the role of management or in an advocacy role, whether the independent auditor's

performance of the service would enhance our ability to manage or control risk or improve audit quality, whether such performance would increase efficiency because of the independent auditor's familiarity with our business, personnel, culture, systems, risk profile and other factors, and whether the amount of fees involved, or the proportion of the total fees payable to the independent auditor in the period that is for non-audit services, would tend to reduce the independent auditor's ability to exercise independent judgment in performing the audit.

All of the non-audit services rendered by Ernst & Young LLP in respect of the 2010 and 2011 fiscal years were pre-approved by the Audit Committee in accordance with this policy.

Ernst & Young LLP informed the Company that they are not aware of any relationship with the Company that, in their professional judgment, may reasonably be thought to bear on the independence of Ernst & Young LLP.

Ratification of the appointment of Ernst & Young LLP by the stockholders is not required by law or by our bylaws. The Board of Directors is nevertheless submitting it to the stockholders to ascertain their views. If this proposal is not approved at the annual meeting by the affirmative vote of holders of a majority of the votes cast at the meeting, the Audit Committee intends to reconsider its recommendation of Ernst & Young LLP as independent auditors. The Company may retain the firm for 2012 notwithstanding a negative stockholder vote.

The Board of Directors recommends a vote FOR ratification of the appointment of Ernst & Young LLP.

PROPOSAL 4: ADVISORY VOTE REGARDING EXECUTIVE COMPENSATION

This proposal, commonly known as "Say on Pay," asks the stockholders to approve the compensation of the Company's named executive officers as described under "Executive Compensation" below in this proxy statement.

The Company's compensation goals are to (i) retain executive talent by offering base pay that is commensurate with pay at other companies of a similar size in the same or similar industries, as adjusted for individual factors, and (ii) drive achievement of annual strategic goals by rewarding executives through incentives tied to goals. Our executive officers were each eligible for a significant incentive compensation component under the Axcelis Management Incentive ("AMI") Plan. These employees would have received an additional amount equal to 60% to 100% of their base pay if the Company had achieved the goals set forth in the AMI Plan. Although in 2011 the Company had its best financial performance in many years, the results fell short of the AMI Plan goals and no incentive compensation was paid to the executives or other participants in the 2011 AMI Plan. Details of the 2011 compensation provided to the named executive officers are in "Compensation Discussion and Analysis" and the accompanying tables and narrative under "Executive Compensation."

The vote solicited by this proposal is advisory and its outcome will not be binding on the Board nor require the Board to take any action. Moreover, the outcome of the vote will not be construed as overruling any decision of the Board or creating or implying any additional fiduciary duty of the Board. However, the Board expects to take into account the outcome of this vote when considering future compensation arrangements for the Company's named executive officers.

The proposal will be considered approved at the annual meeting if more votes are cast in favor than against. Abstentions and broker non-votes will not count as votes cast for or against this proposal.

The Board of Directors recommends a vote FOR approval of the compensation of the Company's named executive officers.

EXECUTIVE COMPENSATION

2011 Compensation Discussion and Analysis

This Compensation Discussion and Analysis is intended to provide a context for the disclosures contained in this Proxy Statement with respect to the compensation paid to the Company's principal executive officer (Mary G. Puma), principal financial officer (Jay Zager), the three most highly compensated other executive officers serving as executive officers at December 31, 2011 included in the Summary Compensation Table below, and Stephen G. Bassett, who served as Chief Financial Officer during a portion of 2011. These executive officers are referred to herein as "named executive officers" or "NEOs." Specifically, this Compensation Discussion and Analysis will explain the objectives and material elements of the compensation of the NEOs during 2011.

Compensation Principles and Tools

The Company's executive compensation program is designed to:

- (1) retain executive talent by offering compensation that is commensurate with pay at other companies of a similar size in the same or similar industries, as adjusted for individual factors; and
- (2) drive achievement of annual strategic goals by rewarding executives through incentive pay tied to approved financial and operational goals.

All executive compensation is determined by the Compensation Committee of the Board of Directors. For a discussion of the Committee's processes in general, see "Corporate Governance—Compensation Committee" elsewhere in this Proxy Statement. Executive compensation for incumbent executives is reviewed annually.

In 2011, the Committee engaged Pearl Meyer & Partners, a compensation consultant, to provide market-based compensation information for both cash and equity compensation for each of the executive officer positions at Axcelis. Pearl Meyer developed a 2011 Peer Group of companies that were used for comparison purposes. The peer companies were selected based on their participation in the semiconductor equipment and related industries, a revenue level range around the Company's revenues and a factor based on the ratio of market capitalization to revenue. The 2011 Peer Group included Advanced Energy Industries, Inc., ATMI, Inc., Cymer, Inc., Entegris, Inc., FEI Company, FormFactor, Inc., GT Advanced Technologies Inc. (formerly GT Solar International, Inc.), Mattson Technology, Inc., MKS Instruments, Inc., Photronics, Inc., Rudolph Technologies, Inc., Tessera, Inc., Varian Semiconductor Associates, Inc. and Veeco Instruments, Inc. The median revenue in their most recently reported fiscal year for the 15 peer companies was \$534 million, or just below two times the Company's 2010 revenue level. Compensation information from these 2011 Peer Group companies was obtained from proxy statements and other filings available prior to March 2011. Pearl Meyer also used some broader high technology survey data. An average of Peer Group data and broader survey data was developed to benchmark cash compensation for the positions of Chief Executive Officer, Chief Financial Officer, Chief Operating Officer (used as one of multiple benchmarks for Mr. Brewer) and Top Legal (used as one of multiple benchmarks for Ms. Fallon). The other executive roles were matched to survey data from high technology firms having similar revenue levels to the 2011 Peer Group because insufficient Peer Group matches were available in the proxy data. For equity benchmarking, Pearl Meyer provided benchmarks both in terms of Black Scholes value and "Opportunity value" (the percent of shares outstanding) for annual executive grants, using a combination of Peer Group data and survey data, depending on availability of Peer Group data for certain positions. This market data was used by the Committee, together with recommendations from the Chief Executive Officer to assess 2011 cash and equity compensation of the executive officers.

In 2011, the Compensation Committee reviewed all elements of each NEO's compensation in the context of each executive's total compensation. This was done by reviewing comprehensive reports on each executive's current and historical base and annual incentive cash compensation, equity portfolio and contractual arrangements with the Company.

Material Elements of Named Executive Officer Compensation

The key elements of NEO compensation are: base salaries; an annual cash incentive program; equity compensation; and a "double-trigger" Change of Control Agreement. Executives also may participate, on the same terms as all other employees, in an Employee Stock Purchase Plan, a 401(k) retirement savings plan and health and welfare benefits.

The following discussion seeks to explain why Axcelis has chosen to pay each compensation element, how Axcelis determines the amount of each element, and how the element and the Company's decisions regarding that element in 2011 fit into the Company's overall compensation objectives and affect decisions regarding other elements.

Base Salary. The Company pays a base salary to each of its NEOs. The objective is to provide base compensation to the executive that is at or above the 50th percentile of the market data for base compensation for the benchmarked position, because Axcelis believes that this is necessary to attract and retain suitably qualified executives. Base pay for NEOs is set on commencement of employment with the Company and annually reviewed thereafter. In the event that base pay is a factor in calculating annual incentive cash compensation or equity grants, when fixing or adjusting base pay, the Compensation Committee will consider the impact of a change on these other compensation components.

CEO Base Pay in 2011. In 2011 Ms. Puma's base pay reverted to the \$500,000 level specified in her Employment Agreement after having been reduced during 2009 and 2010 by 20% to \$400,000 under a modification signed in May 2009. In April 2011, the Compensation Committee voted to increase Ms. Puma's base pay to \$550,000 effective May 1, 2011 since her base salary was at the 30th percentile of the CEO base pay benchmark developed by Pearl Meyer in the report discussed above. Subsequently, at Ms. Puma's request, the effective date of such increase was set at January 1, 2012, with the condition that if Ms. Puma is at any time entitled to separation pay under her employment agreement or under her Change of Control Agreement, all amounts due to her shall be calculated as if such increase had become effective on May 1, 2011. In 2012, the effective date of this increase was further deferred until January 1, 2013.

2011 Base Pay for the Other NEOs. Mr. Zager's base pay in 2011 was initially fixed by the Compensation Committee in January 2011 as part of the Company's employment offer package to him. All other NEOs began 2011 with the same base compensation as they received in 2010.

Mr. Bassett, who served as the Company's Chief Financial Officer at the beginning of the year, retired from employment with the Company on March 31, 2011. He received 9 months of pay as separation pay compensation under an Executive Retirement Agreement with the Company. In addition, certain of Mr. Bassett's equity awards accelerated on termination of employment. These compensation arrangements for Mr. Bassett were approved by the Compensation Committee in 2010.

At its meeting in April 2011, the Compensation Committee reviewed the cash compensation of each NEO. Ms. Puma recommended that the Compensation Committee increase the base compensation of Mr. Brewer and Ms. Fallon, effective May 1, 2011. Multiple benchmarks were established in the Pearl Meyer report for Mr. Brewer and Ms. Fallon in light of the scope of their responsibilities. The Committee supported an increase for Mr. Brewer based in part on the fact that his then base compensation was at the 25th percentile of Pearl Meyer's Chief Operating Officer benchmark. While Mr. Brewer does not hold the title of Chief Operating Officer, he is responsible for

manufacturing operations, facilities, information technology, environmental health and safety and a portion of engineering. Ms. Fallon's increase was also approved by the Committee, based in part on the fact that Ms. Fallon's then base compensation fell at the 35th percentile of Pearl Meyer's benchmark for Top Legal with a 15% premium, which was deemed an appropriate benchmark in light of her management of human resources as well as legal.

Annual Cash Incentive. Axcelis usually offers an annual cash incentive target as part of executive compensation to place a portion of compensation at risk in order to incent the executive to achieve specific company goals. Although executives understand that the payout under a cash incentive program will depend on the Company's performance overall and the executive's individual performance, the stated cash incentive target for a particular position is an important part of a competitive compensation package to attract and retain executives.

2011 Cash Incentive. In February 2011, the Compensation Committee adopted an annual incentive plan, called the 2011 Axcelis Management Incentive Plan, in which the NEOs participated. The Committee set a target payout under the 2011 Axcelis Management Incentive Plan for Ms. Puma at 100% of her 2011 base compensation and for each of the other NEOs at 60% of 2011 base compensation. These annual cash incentive targets were reviewed and confirmed by the Compensation Committee in April 2011 against the benchmarking in the Pearl Meyer report.

The 2011 Axcelis Management Incentive Plan provided for a company performance score which could range from 0% to 200%, based on the achievement of four financial metrics, as set forth in the chart below, establishing a 0%, 100% and 200% score for each of the metrics. Each metric was individually weighted, so that the scored, weighted metrics would be totaled for a final score. The Committee chose these metrics because they are critical indicia of the Company's financial performance. The 100% target for each metric reflected the expected results if the Company was able to execute on its 2011 profit plan, which provided for 45% revenue growth over 2010, as well as for improved operating profit and gross margins. Regardless of the achievement of the specific financial metrics, any payout under the 2011 Axcelis Management Incentive Plan was conditioned on the Company's achievement of \$20 million in net income for the year ended December 31, 2011. Assuming this threshold condition was met, each NEO's payout under the 2011 Axcelis Management Incentive plan would equal the company performance score multiplied by an individual performance rating to be determined by the Compensation Committee, ranging from 0% to 150%.

The metrics were:

<u>2011 Axcelis Management Incentive Plan Financial Metrics</u>	<u>Weighting</u>
Full Year 2011 Revenue	33 ¹ /3%
Full Year 2011 Operating Profit	33 ¹ /3%
Q4 2011 Systems Gross Margin Percentage	16.67%
Q4 2011 Global Service Solutions Gross Margin Percentage	16.67%

The Company failed to achieve \$20 million in net income in 2011, which precluded any payout under the 2011 Axcelis Management Incentive Plan regardless of achievement against the financial metrics above (all of which were also below the minimum targets for a payout). These results reflected the decline in the market for the Company's products and services which occurred in the second half of 2011 and the general semiconductor industry slowdown. Accordingly no payouts were approved under the 2011 Axcelis Management Incentive Plan to the NEOs, as reflected in the 2011 Summary Compensation Table below

Long Term Incentive Compensation through Equity. The Compensation Committee also usually provides annual grants of equity compensation to the NEOs. Equity compensation for NEOs, which has taken the form of stock options and restricted stock units, is designed to align the interests of

executives with those of our investors and to retain executives during multi-year vesting periods. Equity grants are a key retention device as a result of vesting provisions which typically extend over four years. Long term ownership of equity awards is further encouraged through the Company's executive stock ownership guidelines, which establish a minimum number of shares that the executive must own. During 2011, these guidelines required ownership ranging from the lesser of three times base pay or 215,000 shares, in the case of Ms. Puma, to the lesser of 1.5 times base pay or 65,000 shares, in the case of the other NEOs. These guidelines were intended to insure that the executive's interest in the value of the Company's stock was not limited to stock price appreciation via options without a downside.

Equity grants are also intended to drive performance, in that the value ultimately realized is linked to stock price appreciation. Option grants have no value without stock price appreciation, and restricted stock units have value at grant that can increase with stock price appreciation. Thus, equity grants should constructively influence management's motivation to enhance the value of the Company's stock. Equity grants to executives are made upon hire and, typically, thereafter on an annual basis. Annual equity grants to executive officers have been made in most years in order to ensure a meaningful retentive effect by maintaining the percentage of the executive's equity position that is unvested.

The Compensation Committee determines the form of equity grants made to the NEOs. The 2000 Stock Plan permits the Compensation Committee to award several different forms of equity rights, including restricted stock, restricted stock units, incentive stock options and non-qualified stock options. Past equity grants to NEOs have taken the form of non-qualified stock options and restricted stock units. It is the Committee's general practice to approve equity awards with a future effective date, usually on the 15th of the month following the approval. The Company believes that this time period between the approval and effectiveness of an equity grant means that the Committee is unable to know or estimate the trading price of the Company's common stock on the effective date of grant. As a result, the Committee has not, to date, thought it necessary to adopt a policy of timing the approval or effectiveness of equity awards to specific dates following the release of financial results or other material information.

2011 Annual Equity Grants. In 2011, the Compensation Committee determined that stock options were an attractive form of equity compensation given the Company's opportunity to drive stock price increases through improved performance. Accordingly, in April 2011, after reviewing the values of each executive's equity portfolio and the benchmarking of equity grants in the 2011 Pearl Meyer report, the Committee approved a stock option grant to each NEO. As discussed above, in determining the appropriate size of these option grants, the Committee considered (a) equity compensation values for executive positions as reported in general compensation surveys by high technology companies and semiconductor and semi equipment firms and (b) executive equity grant information reported in recent proxy statements by the Peer Group companies named above. Specifically, the Committee considered the Black-Scholes values of the equity awards at the 50th percentile of market data for each benchmarked position, calculating the grant sizes these Black Scholes values would require for the Company, assuming certain grant date stock prices. The Pearl Meyer report also provided the 50th percentile of the benchmarked grants in terms of the percent of outstanding equity represented by the grant, which is referred to by Pearl Meyer as "Opportunity" value. Given the Company's stock price and a desire to control the Company's burn rate for employee equity grants, the Committee approved 2011 stock option grants based on the benchmarked 50th percentile of the Opportunity value of grants for each position. This approach resulted in grant sizes below the benchmarked 50th percentile of Black-Scholes values. The 2011 stock option grants to NEOs are set forth in the Grants of Plan Based Awards in Fiscal 2011 table below. In setting the vesting provisions for the stock options grants to the NEOs in 2011, the Committee sought to balance the reward and retentive effects of such equity grants by setting the vest dates for 25% of such shares on each of the next four anniversaries of the grant date.

These grants are exercisable for a number of shares that the Committee considered an appropriate incentive for each of the NEOs to both (1) provide a retentive effect on the executive during the four year vesting period and (2) incentivize the executive to improve Company performance and stock price. In determining the size of these grants, the Committee took into account the Company's total outstanding shares, grants made to non-executive employees and an appropriate total annual burn rate for the Company's equity compensation. The grant date fair values of these grants are lower than available competitive market information might suggest for executives in these positions. If the Committee had been guided by such data and sized the 2011 equity grants using Black-Scholes or another valuation methodology that takes the trading price into account, the grants would have been inappropriately large. Given the opportunity to improve the stock price from the exercise price set on July 15, 2011, the Committee believes that these grants are of sufficient size to create a meaningful financial incentive.

Change of Control Agreements

Each of the NEOs has a double-trigger Change of Control Agreement with the Company, described below under "Payments on Termination or Change of Control." No actions were taken by the Compensation Committee in 2011 relating to the Change of Control Agreements.

Other Compensation Components

In order to encourage our executives to obtain adequate financial and tax planning assistance, Axcelis reimburses up to \$5,500 of an executive's annual tax and financial planning expenses. This program is the only executive perquisite at Axcelis and amounts paid to NEOs under this program are included in the "All other compensation" column in the Summary Compensation Table.

Executives may elect to make contributions to a retirement account in the Company's IRC Section 401(k) plan, which is available to all employees. The Company has not made 401(k) plan matching contributions to participants' accounts since 2008.

NEOs may also participate in the Company's medical and dental insurance offerings by electing to make payroll deductions designed to cover approximately 25% of the cost of those programs (the Company covers the other 75% of the cost). The Company provides life, accidental death and dismemberment and disability insurance for all employees, and the opportunity to increase coverage levels via payroll deductions.

Finally, the Company maintains the Employee Stock Purchase Plan, an IRC Section 423 plan, a voluntary plan in which employees may purchase Axcelis shares through salary deductions.

Risk Assessment of Compensation Policies and Practices

The Company has determined that its compensation policies and practices for its employees, including the NEOs, do not give rise to risks that are reasonably likely to have a material adverse effect on the Company. In reaching this determination, management engaged in (i) a review of the Company compensation program's policies and practices, (ii) identification of risks, if any, related to the programs, (iii) consideration of the materiality of a potentially risk-related reward to the total compensation provided to the individual, and (iv) identification of those aspects of the program and its oversight that provide risk control. Although all compensation programs were considered, management's review focused on the programs with variability of payout and in which there is a potential for the participant to directly affect payout.

Based on this review, management determined that the compensation policies and practices for Axcelis' employees do not create risks that are reasonably likely to have a material adverse effect on the Company, principally because:

- (1) Base pay is a material component of all employees' total compensation package, so those employees who receive incentive compensation have a total compensation package that is balanced; and
- (2) Our incentive compensation programs are subject to appropriate risk controls in their design and oversight:
 - The Company's internal controls and risk management practices restrict risk-taking that is not consistent with senior management's determinations on appropriate risk;
 - Payment of small bonuses for extraordinary effort or for achieving individual or team goals are subject to approval by direct managers, and representatives of human resources and finance departments, and, for higher amounts, a representative of senior management;
 - Payment of sales commission plans are subject to calculation and approval by the finance department and are tied to actual receipt of payments from the customer;
 - The Company's annual cash incentive plans have a balanced array of performance measures established by the Compensation Committee of the Board of Directors and which include both qualitative and quantitative assessments of performance;
 - Achievement of the objectives under the Company's annual cash incentive plans is first determined by senior management and the finance department and then approved by the Compensation Committee of the Board of Directors prior to payment.

Tax Implications

In setting NEO compensation, the Committee takes into account the impact of IRC Section 162(m), which bars the Company from taking a tax deduction for compensation for any NEO that exceeds \$1 million, subject to exceptions for certain performance-based compensation. To the extent that compensation under an annual cash incentive plan and/or in the form of restricted stock units causes the total compensation paid to an NEO to exceed \$1 million in any year, such excess compensation has not typically been tax deductible to the Company. In the case of cash incentive payments, this is because certain components of the plan, such as the Committee's determination that some operational and individual performance goals have been achieved, may require subjectivity that does not meet the requirements of Section 162(m). In the case of restricted stock unit awards, it is because vesting has typically been based on the length of the NEO's service, which is not performance-based for purposes of Section 162(m).

The Compensation Committee believes that the structure of its cash incentive plans will provide benefits to the Company that outweigh the potential tax deductions that might be available if the plans included only objective performance measures. It also believes that the benefits of the use of service-based restricted stock units to provide long-term incentives outweigh the potential loss of tax deductions from such equity compensation. The Company's tax deductions for compensation have not been limited by Section 162(m) in recent years. The Committee expects to continue to take Section 162(m) into account as it makes decisions in future years and may modify the forms of compensation used accordingly.

In addition, in making compensation decisions, the Committee considers the impact of IRC Section 409A, which imposes certain requirements on "nonqualified deferred compensation plans."

2011 Compensation Committee Report

The Compensation Committee has reviewed and discussed the foregoing Compensation Discussion and Analysis with management and, based on this review and discussion, the Compensation Committee recommended to the Board of Directors that the Compensation Discussion and Analysis be included in this Proxy Statement.

By the Compensation Committee,

H. Brian Thompson, Chairman
R. John Fletcher
Stephen R. Hardis

2011 Summary Compensation Table

Other than Ms. Puma, the named executive officers (NEOs) do not have employment agreements. Ms. Puma's employment agreement is described under the heading "Payments on Termination or Change in Control" in this Proxy Statement. In the case of Ms. Puma, her 2010 and 2009 base compensation reflects her agreement to reduce her base pay by 20% from the amount specified in her employment agreement. In the case of the other NEOs, the 2009 base compensation amounts reflect the eight weeks of unpaid leave required during 2009.

See the "2011 Compensation Discussion and Analysis" for additional information on the 2011 Axcelis Management Incentive Plan.

The proportion that an NEO's salary and non-equity incentive compensation bear to each other and to the NEO's total compensation is largely a result of the various factors involved in the calculation of the payout under the Company's cash incentive plans as described in the "2011 Compensation Discussion and Analysis" above.

<u>Name and Principal Position</u>	<u>Year</u>	<u>Salary (\$)</u>	<u>Stock awards \$(1)</u>	<u>Option awards \$(1)</u>	<u>Non-equity incentive plan compensation \$(2)</u>	<u>All other compensation \$(3)</u>	<u>Total (\$)</u>
Mary G. Puma	2011	\$ 500,001	\$ —	\$ 314,448	\$ —	\$ 330	\$ 814,778
<i>Chairman, Chief Executive Officer and President</i>	2010	\$ 400,001	\$ —	\$ 315,116	\$ 45,000	\$ —	\$ 760,117
	2009	\$ 400,000	\$ —	\$ 166,592	\$ —	\$ —	\$ 566,592
Jay Zager	2011	\$ 336,538	\$ 179,500	\$ 755,496	\$ —	\$ 2,450	\$ 1,273,984
<i>Executive Vice President and Chief Financial Officer(4)</i>							
Matthew P. Flynn	2011	\$ 350,000	\$ —	\$ 188,669	\$ —	\$ 330	\$ 538,998
<i>Executive Vice President, Customer Operations</i>	2010	\$ 350,000	\$ 67,199	\$ 189,070	\$ 45,000	\$ —	\$ 651,268
	2009	\$ 309,615	\$ —	\$ 99,955	\$ —	\$ —	\$ 409,570
Lynnette C. Fallon	2011	\$ 315,096	\$ —	\$ 188,669	\$ —	\$ 220	\$ 503,985
<i>Executive Vice President, HR/Legal and General Counsel</i>	2010	\$ 305,001	\$ 73,200	\$ 157,558	\$ 45,000	\$ —	\$ 580,759
	2009	\$ 269,808	\$ —	\$ 83,296	\$ —	\$ —	\$ 353,104
Kevin J. Brewer	2011	\$ 320,193	\$ —	\$ 188,669	\$ —	\$ 3,875	\$ 512,736
<i>Executive Vice President, Operations</i>	2010	\$ 300,000	\$ 46,684	\$ 189,070	\$ 45,000	\$ 725	\$ 581,479
	2009	\$ 265,385	\$ —	\$ 83,296	\$ —	\$ 945	\$ 349,626
Stephen G. Bassett	2011	\$ 51,923	\$ —	\$ —	\$ —	\$ 202,517	\$ 254,440
<i>Former Executive Vice President and Chief Financial Officer(5)</i>	2010	\$ 300,000	\$ 57,599	\$ 157,558	\$ 45,000	\$ —	\$ 560,158
	2009	\$ 265,385	\$ —	\$ 83,296	\$ —	\$ —	\$ 348,681

- (1) Represents the grant date fair value of the stock and option awards received by the NEO in the year indicated, determined in accordance with FASB ASC Topic 718, using the assumptions described in the Stock Award Plans and Stock-Based Compensation Note to the Company's Financial Statements included in the Form 10-K filed with the Securities and Exchange Commission for the respective year.
- (2) Non-equity incentive plan compensation payments in 2011 and 2010 represent amounts that were paid under the Axcelis Management Incentive Plan for those years, as described in the "2011 Compensation Discussion and Analysis" above.
- (3) In the case of Mr. Zager and Mr. Brewer, the amounts in this column represent amounts reimbursed under the Company's Executive Tax and Financial Planning Reimbursement Program. In the case of Ms. Puma, Mr. Flynn and Ms. Fallon, the 2011 figure includes the value of a service award and in the

case of Mr. Brewer the 2009 figure includes the value of a service award. In the case of Mr. Bassett, the amount reported for 2011 represents 39 weeks of separation compensation provided under his Executive Retirement Agreement with the Company.

- (4) Mr. Zager joined the Company in January 2011.
- (5) Mr. Bassett resigned as Chief Financial Officer in January 2011 and retired from the Company on March 31, 2011.

Grants of Plan Based Awards in Fiscal 2011

Name	Grant Date	Date of Compensation Committee Approval	Estimated Future Payouts Under Non-Equity Incentive Plan Awards(1)		All Other Stock Awards: Number of Shares of Stock or Units (#)(2)	All Other Option Awards: Number of Securities Underlying Options (#)(3)	Exercise or Base Price of Option Awards (\$/Sh)	Grant Date Fair Value of Stock and Option Awards(4)
			Target (\$)	Maximum (\$)				
Mary G. Puma		2/2/2011	\$ 500,000	\$ 1,000,000				
	7/15/2011	4/26/2011				250,000	\$ 1.60	\$ 314,448
Jay Zager	1/17/2011	1/7/2011			50,000	200,000	\$ 3.59	\$ 934,996
	7/15/2011	6/8/2010	\$ 210,000	\$ 420,000		150,000	\$ 1.60	\$ 188,669
Matthew P. Flynn		2/2/2011	\$ 210,000	\$ 420,000				
	7/15/2011	4/26/2011				150,000	\$ 1.60	\$ 188,669
Lynnette C. Fallon		2/2/2011	\$ 192,000	\$ 384,000				
	7/15/2011	4/26/2011				150,000	\$ 1.60	\$ 188,669
Kevin J. Brewer		2/2/2011	\$ 198,000	\$ 396,000				
	7/15/2011	4/26/2011				150,000	\$ 1.60	\$ 188,669

- (1) These target and maximum payouts are under the 2011 Axcelis Management Incentive Plan adopted by the Compensation Committee on February 2, 2011.
- (2) Mr. Zager received restricted stock units under the Company's 2000 Stock Plan on commencement of his employment. Other than future services to the Company, no consideration was paid or will be due in respect of these restricted stock units or the shares issued thereon. These restricted stock units will be forfeited if Mr. Zager's employment terminates prior to vesting, as described in the table entitled Outstanding Equity Awards at Fiscal 2011 Year End.
- (3) The NEOs were granted stock options granted under the Company's 2000 Stock Plan effective July 15, 2011. Other than future services to the Company, no consideration was paid or will be due in respect of these stock options or the shares issued thereon. These stock options will be forfeited if the NEO's employment terminates prior to vesting, as described in the table entitled Outstanding Equity Awards at Fiscal 2011 Year End.
- (4) Represents the grant date fair value of the equity awards received by the NEO in 2011, determined in accordance with FASB ASC Topic 718, using the assumptions described in the Stock Award Plans and Stock-Based Compensation Note to the Company's Financial Statements included in the Form 10-K filed with the Securities and Exchange Commission for 2011.

Outstanding Equity Awards at Fiscal 2011 Year End

Name	Option Awards				Stock Awards	
	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Number of Shares or Units of Stock that Have Not Vested (#)	Market Value of Shares or Units of Stock that Have Not Vested (\$)(7)
Mary G. Puma	100,000	0	\$ 10.28	6/21/2012		
	100,000	0	\$ 5.85	6/21/2012		
	125,000	0	\$ 5.70	5/1/2013		
	125,000	0	\$ 11.48	5/1/2013		
	100,000	0	\$ 11.87	6/25/2014		
	100,000	0	\$ 7.97	6/25/2014		
1	0	250,000	\$ 0.70	11/17/2018		
2	125,000	125,000	\$ 1.16	11/16/2019		
3	62,500	187,500	\$ 1.60	7/15/2020		
	0	250,000	\$ 1.60	7/15/2021		
Jay Zager					50,000.00	\$ 65,000
4						
5	50,000	150,000	\$ 3.59	12/18/2013		
3	0	150,000	\$ 1.60	7/15/2021		
Matthew P. Flynn	5,000	0	\$ 10.28	6/21/2012		
	15,500	0	\$ 6.88	11/5/2012		
	3,750	0	\$ 5.85	6/21/2012		
	11,250	0	\$ 5.70	5/1/2013		
	15,000	0	\$ 11.48	5/1/2013		
	15,000	0	\$ 11.87	6/25/2014		
	15,000	0	\$ 7.97	6/25/2014		
6	0	150,000	\$ 0.70	11/17/2018		
2	37,500	75,000	\$ 1.16	11/16/2019		
3	37,500	112,500	\$ 1.60	7/15/2020		
	0	150,000	\$ 1.60	7/15/2021		
Lynnette C. Fallon	30,000	0	\$ 10.28	6/21/2012		
	30,000	0	\$ 5.85	6/21/2012		
	30,000	0	\$ 5.70	5/1/2013		
	30,000	0	\$ 11.48	5/1/2013		
	30,000	0	\$ 11.87	6/25/2014		
	30,000	0	\$ 7.97	6/25/2014		
6	0	125,000	\$ 0.70	11/17/2018		
2	62,500	62,500	\$ 1.16	11/16/2019		
3	31,250	93,750	\$ 1.60	7/15/2020		
	0	150,000	\$ 1.60	7/15/2021		
Kevin J. Brewer	7,143	0	\$ 10.28	6/21/2012		
	15,000	0	\$ 6.88	11/5/2012		
	7,143	0	\$ 5.85	6/21/2012		
	10,000	0	\$ 5.70	5/1/2013		
	10,000	0	\$ 11.48	5/1/2013		
	15,000	0	\$ 11.87	6/25/2014		
	15,000	0	\$ 7.97	6/25/2014		
6	0	125,000	\$ 0.70	11/17/2018		
2	62,500	62,500	\$ 1.16	11/16/2019		
3	37,500	112,500	\$ 1.60	7/15/2020		
	0	150,000	\$ 1.60	7/15/2021		

<u>Name</u>	<u>Option Awards</u>				<u>Stock Awards</u>	
	<u>Number of Securities Underlying Unexercised Options (#) Exercisable</u>	<u>Number of Securities Underlying Unexercised Options (#) Unexercisable</u>	<u>Option Exercise Price (\$)</u>	<u>Option Expiration Date</u>	<u>Number of Shares or Units of Stock that Have Not Vested (#)</u>	<u>Market Value of Shares or Units of Stock that Have Not Vested (\$)(7)</u>
Stephen G. Bassett	20,000	0	\$ 9.90	3/31/2012		
	25,000	0	\$ 11.87	3/31/2012		
	25,000	0	\$ 7.97	3/31/2012		
	125,000	0	\$ 0.70	3/31/2012		
	62,500	0	\$ 1.16	3/31/2012		

- (1) The unexercisable options will become exercisable on or after November 17, 2012, if and when the closing price of the Company's common stock as reported by the Nasdaq has remained above \$5.00 per share (as adjusted for any stock splits, stock dividends, stock combinations or other similar change in capitalization) for a period of not less than 20 consecutive trading days, provided that the foregoing proviso will be deemed satisfied in the event that a change of control as defined in the 2000 Stock Plan has occurred on or before the date of exercise.
- (2) The unexercisable options will become exercisable as to $\frac{1}{2}$ of such shares on each of November 16, 2012 and 2013.
- (3) The unexercisable options will become exercisable as to $\frac{1}{3}$ of such shares on each of July 15, 2012, 2013 and 2014.
- (4) The unvested restricted stock units will become exercisable as to 25% of the shares on each January 17, 2012, 2013, 2014, and 2015.
- (5) The unexercisable options will become exercisable as to 25% of the shares on each January 17, 2012, 2013, 2014, and 2015.
- (6) The unexercisable options will become exercisable on or after November 17, 2012, if and when the closing price of the Company's common stock as reported by the Nasdaq has remained above \$4.00 per share (as adjusted for any stock splits, stock dividends, stock combinations or other similar change in capitalization) for a period of not less than 20 consecutive trading days, provided that the foregoing proviso will be deemed satisfied in the event that a change of control as defined in the 2000 Stock Plan has occurred on or before the date of exercise.
- (7) Using the closing market price on December 30, 2011 of \$1.33.

Option Exercises and Stock Vested During Fiscal 2011

Name	Option Awards		Stock Awards	
	Number of Shares Acquired on Exercise (#)	Value Realized on Exercise \$(1)	Number of Shares Acquired on Vesting #(2)	Value Realized on Vesting \$(3)
Mary G. Puma	0	—	26,840	\$ 45,360
Jay Zager	0	—	0	\$ —
Matthew P. Flynn	22,500	\$ 36,675	16,909	\$ 28,576
Lynnette C. Fallon	0	—	16,373	\$ 27,670
Kevin J. Brewer	0	—	13,421	\$ 22,681
Stephen G. Bassett	0	—	14,816	\$ 39,262

- (1) Represents the difference between the closing market price of the underlying shares on the date of exercise and the exercise price of the option.
- (2) Represents shares vested during 2011 on restricted stock units. A portion of these vested shares were withheld, and not issued, by the Company for purposes of tax withholding. A portion of Mr. Bassett's restricted stock units vested on his termination of employment on March 31, 2011. The remaining unvested restricted stock units held by Mr. Bassett forfeited on that date.
- (3) Represents the total for all of the NEO's vesting dates during 2011 of the products of (A) the number of shares vested on a 2011 vesting date multiplied by (B) the closing market price on the vesting date or, if the shares vest on a day which is not a trading day, the first trading day after the vesting date. The actual amount received by the executives on the sale of the net shares issued on restricted stock units will depend on the market values at the time of such transactions.

Payments on Termination or Change of Control

Employment Agreement with Ms. Puma. The Company has had an Employment Agreement with Ms. Puma since November 2007 that provides for a one-year term of employment at a minimum annual base salary of \$500,000 and an annual target incentive compensation opportunity of 100% of base salary. In 2011, the Compensation Committee approved an increase in Ms. Puma's base pay to \$550,000. Having voluntarily reduced her base salary to \$400,000 in 2008 and 2009, Ms. Puma declined to accept a pay increase in 2011 and deferred the base pay increase until January 1, 2012 (which increase has been further deferred until January 1, 2013). It was also agreed that separation payments that might become due under her Employment Agreement or her Change of Control Agreement would be calculated as if Ms. Puma's pay had increased in 2011.

Ms. Puma's base salary and incentive opportunities may be subject to future adjustment by the Board, but not below the minimum levels in her Employment Agreement, unless mutually agreed. The term of Ms. Puma's agreement automatically renews on a year-to-year basis unless one party notifies the other that the agreement will not be extended. Such termination notice must be sent within a 60 day window period beginning 180 days prior to the next anniversary of the effective date. The agreement also provides that Ms. Puma will participate in the 2000 Stock Plan, the 401(k) savings plan and the welfare benefit plans that we sponsor.

In the event Ms. Puma's employment is terminated prior to the end of the term for reasons other than cause, death, disability or voluntary resignation without "good reason," she is entitled to receive all compensation accrued to date, acceleration of vesting of options and other equity rights and a cash separation payment. The cash separation payment will equal 24 months of her base compensation and two times an annual bonus amount determined in accordance with the agreement. For this purpose, Ms. Puma's annual bonus compensation will be her current base multiplied by the greater of (a) the percentage of her base that she actually received as a bonus for the prior fiscal year or (b) 25%. The

following table sets forth the separation pay that would have been due to Ms. Puma if a qualifying termination occurred on December 31, 2011:

Lump sum cash payment(1)	Value of accelerated vesting on equity awards(2)	18 months of COBRA premiums for health coverage(3)	Total
\$1,250,000	\$178,750	\$32,516	\$1,461,266

- (1) This amount represents 24 months of Ms. Puma's base salary at the highest rate in effect in the year preceding December 31, 2011 plus 24 months of the minimum bonus amount specified in the agreement equal to 25% of the base pay. As discussed in the Compensation Discussion and Analysis, the Compensation Committee approved an increase in Ms. Puma's base pay in 2011, but it was agreed that the increase would be effective in 2012 except for the purposes of any separation pay calculation under either Ms. Puma's Employment Agreement or Change of Control Agreement. Accordingly, the monthly rate of pay (\$45,833) and monthly bonus amount (\$10,417) were calculated taking the 2011 increase into account. This amount is due within 30 days of termination.
- (2) This amount reflects a valuation of the acceleration of Ms. Puma's outstanding equity awards using the methodology prescribed under IRC Section 280G, which provides for an excise tax on certain change of control payments. This valuation is based on the closing price of our common stock on the last trading day of 2011 (\$1.33). The actual amount received by Ms. Puma on exercise of options and sales of shares issued on restricted stock units will depend on the market values at the time of such transactions.
- (3) Ms. Puma's employment agreement provides that the Company will pay for up to 18 months of COBRA premiums. This amount represents 18 months of COBRA premiums in effect during 2011 for Ms. Puma's coverage elections. Actual COBRA rates changed on January 1, 2012.

In the event of an actual termination of Ms. Puma's employment, it is possible that her separation pay would be renegotiated by Ms. Puma and the Board of Directors, in which case the amounts payable might differ from the foregoing.

Change of Control Agreements. The Company has entered into a Change of Control Agreement with each of our executive officers, including Ms. Puma, to provide that severance compensation will be paid in a lump sum within 30 days of a covered termination following a change in control, as defined in the agreement. These Change of Control Agreements provide that executive officers are entitled to severance compensation in the event there is both (1) a change in control and (2) a termination of employment within three years of that change in control for reasons other than cause, death, disability or voluntary resignation without Good Reason. Under the Change of Control Agreements, "Good Reason" can be a material diminution in the executive's authority, a material reduction in base pay or a material change in geographic location of the executive's job. A "change of control" is defined in the agreement and covers a number of events, including a merger or acquisition involving the Company in which the persons holding the Company's shares immediately prior to the transaction hold less than 75% of the shares outstanding after the transaction.

In these agreements, the executives have agreed not to be engaged by, or own, any business competing with any of the businesses conducted by the Company for a period of 12 months following any termination of employment (whether or not following a change of control). The executives also agreed not to solicit employees of the Company to leave employment with the Company or solicit or induce customers of the Company to cease doing business with the Company, during such period.

If severance compensation is payable, it would consist of a cash payment equal to the sum of (a) the Company's accrued obligations for base pay and incentive compensation and (b) the amount determined by multiplying the executive's then salary and average bonus by three. For this purpose, an executive's average bonus is his or her current bonus opportunity multiplied by the average of the individual performance scores given to the executive in the last three years, but without taking into account company performance scores. In the event such severance is payable, all unvested restricted stock units and options held by the executive will become vested until termination or expiration in accordance with their terms. We will also reimburse the executive for the effects, including federal, state and local income tax consequences, of any excise tax due on severance compensation, as shown in the chart below. The excise taxes due under Sections 280G and 4999 of the IRC are unpredictable and can have widely divergent and unexpected effects based on an executive's personal compensation history. Therefore, to provide a predictable and equal level of benefit between individuals without regard to the effect of the excise tax, the Company determined that it was appropriate to pay the cost of this excise tax plus an amount needed to pay income taxes due on such additional payment. The amounts due to each named executive officer in the event that a change of control and termination occurred on December 31, 2011 are set forth in the table below:

Estimated Payments under the Change of Control Agreements if due at December 31, 2011

Name(1)	Lump sum cash payment(2)	Value of accelerated vesting on equity awards(3)	Excise tax due under IRC 280G, plus gross-up amount(4)	Total
Mary G. Puma	\$ 4,004,000	\$ 178,750	\$ 1,736,296	\$ 5,919,046
Jay Zager	\$ 1,834,000	\$ 66,500	\$ 756,414	\$ 2,656,914
Matthew P. Flynn	\$ 1,974,000	\$ 107,250	\$ 808,292	\$ 2,889,542
Lynnette C. Fallon	\$ 1,776,000	\$ 89,378	\$ 723,356	\$ 2,588,734
Kevin J. Brewer	\$ 1,811,700	\$ 89,378	\$ 764,676	\$ 2,665,754

- (1) Mr. Basset's Change of Control Agreement was terminated effective March 31, 2011 under his Executive Retirement Agreement with the Company.
- (2) This amount, which is due within 30 days of termination, represents (A) separation pay equal to three times (2.9 times in the case of Mr. Zager) the NEO's current base salary plus an average bonus amount based on past performance assessments and (B) the amount earned but unpaid under the 2011 Axcelis Management Incentive Plan at target. Ms. Puma's cash payment was calculated using the base pay level approved by the Compensation Committee in 2011 in accordance with the understanding between Ms. Puma and the Company.
- (3) This amount reflects a valuation of the acceleration of the NEO's outstanding equity awards using the methodology prescribed under IRC Section 280G, which provides for an excise tax on certain change of control payments. This valuation is based on the closing price of our common stock on the last trading day of 2011 (\$1.33). The actual amount received by the NEO on exercise of options and sales of shares issued on restricted stock units will depend on the market values at the time of the change of control.
- (4) The Change of Control Agreement with each NEO provides for the Company's reimbursement of the excise tax liability due on the separation pay under IRC Section 280G, which amount is grossed up to cover income taxes due on such reimbursement. Therefore, the amounts shown in this column represent amounts due to taxing authorities and will not be retained by the executive.

In the event Ms. Puma receives payment under her Change of Control Agreement, she will not receive amounts and benefits due under her Employment Agreement unless such amounts are in excess of the amounts paid under the Change of Control Agreement. Also, in the event of an actual termination of an NEO's employment in connection with a change of control, it is possible that the NEO's separation pay would be renegotiated by the NEO and the Board of Directors, in which case the amounts payable might differ from the foregoing.

COMPENSATION OF DIRECTORS

The Nominating and Governance Committee has responsibility under its charter to review and recommend non-employee director compensation for adoption by the full Board. All equity grants to non-employee directors are either made under automatic granting language in the 2000 Stock Plan or by the Compensation Committee on the recommendation of the Board of Directors.

2011 Director Fees. Cash retainers and meeting fees for our non-employee directors, which have not changed since 2007, are as follows:

Retainers (paid in quarterly installments)	
Lead Director	\$50,000
Board Member (not Lead Director)	\$30,000
Audit Committee Chair	\$15,000
Compensation Committee Chair	\$10,000
Nominating and Governance Committee Chair	\$7,500
Meeting Fees (paid quarterly following meetings)	
In Person Board Meetings	\$2,000 per meeting
Telephone Board Meetings	\$1,000 per meeting
In Person or Telephone Committee Meetings	\$1,000 per meeting, only to committee members

Non-employee directors also receive reimbursement of out-of-pocket expenses incurred in attending Board and committee meetings. Non-employee directors do not receive any Company-paid perquisites.

The Board of Directors may, from time to time, form ad hoc committee(s) in addition to the Audit, Compensation and Nominating and Governance Committees and fix compensation for service on such ad hoc committees.

2011 Equity Awards. All non-employee directors of Axcelis receive an automatic initial stock option grant for 40,000 shares under our 2000 Stock Plan upon initial election to the Board. These non-employee director options have an exercise price equal to the closing price of our common stock on the grant date and are fully exercisable on the 181st day after the date the option is granted, provided the optionee is still a director on that date. The options have a term of ten years from the date of grant. Mr. Braun and Mr. Keithley each received these automatic non-employee director grants in 2011.

On April 26, 2011, the Compensation Committee approved the issuance under the 2000 Stock Plan of non-qualified stock options exercisable for 40,000 shares of common stock to each of the non-employee directors, effective July 15, 2011. These option grants became fully exercisable on the 181st day after the date of grant as each director remained in service on that date. Long term ownership of equity awards by directors is encouraged through the Company's director stock ownership guidelines in effect during 2011, which provide that non-employee directors should own at least the lesser of (i) a value equal to at least three times the amount of the annual base retainer paid to outside directors for service on the Board (which was \$30,000 in 2011), excluding additional committee retainers, if any, or (ii) 20,000 shares of Axcelis common stock. This level was set to create meaningful investments by directors in shares of the Company, so that their interest in the value of the Company's stock was not limited to stock price appreciation via options without a downside.

Director Compensation during Fiscal 2011

The chart below shows compensation for all non-employee directors who served the Company during 2011:

<u>Name</u>	<u>Fees earned or paid in cash (\$)</u>	<u>Stock awards (\$)(1)</u>	<u>Option awards (\$)(2)(3)</u>	<u>Total (\$)</u>
Edward H. Braun	\$ 45,000	\$ —	\$ 86,618	\$ 131,618
R. John Fletcher	\$ 54,000	\$ —	\$ 50,312	\$ 104,312
Stephen R. Hardis	\$ 72,000	\$ —	\$ 50,312	\$ 122,312
William C. Jennings	\$ 64,000	\$ —	\$ 50,312	\$ 114,312
Joseph P. Keithley	\$ 21,000	\$ —	\$ 48,334	\$ 69,334
Patrick H. Nettles	\$ 56,500	\$ —	\$ 50,312	\$ 106,812
H. Brian Thompson	\$ 59,000	\$ —	\$ 50,312	\$ 109,312

- (1) The non-employee directors did not receive any restricted stock grants in 2011.
- (2) The amount shown represents the grant date fair value of the option awards received by the director in 2011, determined in accordance with FASB ASC Topic 718, using the assumptions described in the Stock Award Plans and Stock-Based Compensation Note to the Company's Financial Statements included in the Form 10-K filed with the Securities and Exchange Commission for 2011.
- (3) As of December 31, 2011, the non-employee directors in office held the following total stock options, all of which (except the 2011 grants discussed above) were fully vested and had exercise prices ranging from \$0.44 to \$16.63:

	<u>Aggregate # of shares subject to outstanding options</u>		
		<u>Lowest exercise price</u>	<u>Highest exercise price</u>
Edward H. Braun	80,000	\$ 1.60	\$ 2.74
R. John Fletcher	195,000	\$ 0.44	\$ 11.91
Stephen R. Hardis	135,000	\$ 1.60	\$ 11.91
William C. Jennings	195,000	\$ 0.44	\$ 11.91
Joseph P. Keithley	40,000	\$ 1.54	\$ 1.54
Patrick H. Nettles	185,000	\$ 0.44	\$ 11.91
H. Brian Thompson	185,000	\$ 0.44	\$ 11.91

CORPORATE GOVERNANCE**Board of Directors Leadership Structure**

Our Governance Policies provide that, if the Chairman of the Board is the Chief Executive Officer, the independent directors shall elect a Lead Director. The Board believes that having a Lead Director allows the Chief Executive Officer to focus principally on managing the Company, enhances Board administration and communications between the independent directors, and allows for consistent Board leadership during any Chief Executive Officer transition. Accordingly, when Mary G. Puma became Chairman of the Board of Directors in May 2006 in addition to her role as Chief Executive Officer, Stephen R. Hardis was appointed by the Board as Lead Director. The responsibilities of the Lead Director include:

- Setting the board's agenda in collaboration with the CEO;
- Acting as a regular communication channel between the board and CEO;

- Organizing and presiding over executive sessions to review the Company's performance and management effectiveness;
- Conducting exit interviews with resigning senior managers to determine whether their departure reflect problems with the CEO or other company issues;
- Coordinating the activities of the independent directors;
- With the Chairman of the Nominating and Governance Committee, addressing any actions arising from the annual Board self-evaluation, coordinating the assessment of the committee structure, organization, and charters, and evaluating the need for any changes; and
- Coordinating the performance evaluation of the Chairman and CEO.

The Board designates the Lead Director annually after each annual meeting of shareholders. Our Board has determined that this leadership structure is appropriate for our business because the title of Chairman is commonly recognized by our customers as being the top management position. Giving Ms. Puma that title ensures that she is recognized by all third parties as our most senior manager. In practice, the role of the Lead Director as described above and in our Governance Policies encompasses all of the management oversight and Board leadership functions typically held by a non-executive Chairman. The Company provides an appropriately substantial retainer to compensate the outside director assuming the Lead Director role for the director's time, effort and focus.

Risk Oversight

Axcelis' business involves many unavoidable operational and financial risks which management and our Board seek to mitigate through careful planning and execution. Our risks include:

- The highly competitive nature of the semiconductor equipment industry, which may limit the rate and level of acceptance of our current products by customers;
- We may be unable to continually invest in product improvement and new product development to meet customer expectations for both technological and cost factors;
- We may be unable to maintain an adequate a global infrastructure to support our customers;
- The cyclical nature of the semiconductor industry and its overall condition in a particular period;
- We may be unable to access sufficient capital to meet fluctuating capital requirements; and
- The uncertainties of global economies, including the availability of credit.

The Board of Directors has two primary methods of overseeing risk. The first method is through its Enterprise Risk Management ("ERM") process, which allows for full Board oversight of the most significant risks facing the Company. The second is through the functioning of the Board committees. The Board of Directors established the ERM process to ensure a complete company-wide approach to risk over seven core areas:

- Industry and Competition;
- Product Quality and Service;
- Product Development;
- Gross Margin;
- Supply Chain;
- Strategic Planning; and
- Customer Operations.

The goal of the ERM process is to provide an ongoing effort, effected at all levels of the Company across all corporate functions, to identify and assess risk, monitor risk, and agree on mitigating action. At each quarterly in-person Board meeting, senior management provides a report on specific risks identified within each of the core areas, commenting on the trend and the status of the risk at the time of the report. The Audit Committee will periodically review the ERM process to ensure that it is robust and functioning effectively.

In addition to the ERM process, each committee of the Board oversees specific areas of risk relevant to the committee through direct interactions with the Chief Executive Officer and the heads of corporate functions. For instance, the Audit Committee oversees risk relating to Finance, IT, Business Integrity and Sarbanes-Oxley reporting through its interactions with the Chief Financial Officer and Controller. A committee may address risks directly with management or, where appropriate, may elevate a risk for consideration by the full Board.

The separate ERM process and Board committee approach to risk management leverages the Board's leadership structure to ensure that risk is overseen by the Board on both a Company-wide approach and through specific areas of competency.

In order to ensure that longer term risks are also considered by the Board in a timely and consistent matter, the full Board dedicates one in-person meeting each year to review and approve a strategic plan and to review and approve a profit plan. These plans are used to manage the business throughout the year. In addition, one Board meeting each year is focused on longer term technology development to ensure the emerging market trends are identified understood and their implications for Axcelis' products appropriately addressed. Finally, the Board dedicates an in-person meeting each year to an executive talent review, which includes a review and discussion of succession planning for key management positions.

Board of Directors Independence and Meetings

The Board of Directors has determined that all directors who served on the Board during 2011, other than Ms. Puma, are or were independent under the criteria established by NASDAQ, and that the members of the Audit Committee also meet the additional independence requirements of the Securities and Exchange Commission. None of the directors, to the Company's knowledge, had any business, financial, family or other type of relationship with the Company or its management (other than as a director and stockholder of the Company), except for any relationships that the Board considered to be immaterial under the NASDAQ independence standards. In determining that each such director is independent, the Board considers whether Axcelis purchases and sells products and services from and to companies (or their affiliates) at which directors are or have been employed as officers or serve as directors. During 2011, Mr. Hardis served as a director of an entity that sold products or services to the Company. The amount paid to the other entity by the Company was below the total revenue threshold in the NASDAQ independence standards (that is, the greater of \$200,000 or 5% of the recipient's consolidated gross annual revenues). The Board has determined that this relationship did not impair Mr. Hardis' independence.

Our Board of Directors held six meetings during 2011. Independent directors have regularly scheduled executive sessions at which only independent directors are present. The average rate of attendance at Board and committee meetings for all current directors was 99% and the lowest rate of attendance for any one director was 94%. All Board members whose terms continue after the annual meeting of stockholders are expected to attend the annual meeting of stockholders, subject to special circumstances. All Board members then in office attended the annual meeting in 2011.

Our Board has standing Audit, Compensation and Nominating and Governance Committees.

Compensation Committee

During 2011, the Compensation Committee was composed of Mr. Thompson (Chairman), Mr. Hardis and Mr. Fletcher. The Compensation Committee holds four regularly scheduled meetings per year and occasionally calls special meetings or acts by written consent to address particular matters. In 2011, the Compensation Committee met six times. The Compensation Committee operates under a written charter, a copy of which is available on our website at www.axcelis.com.

The Compensation Committee establishes the compensation philosophy for Axcelis and has all the authority of the Board of Directors to act or exercise corporate powers with respect to the compensation of the executive officers and the administration of Axcelis' equity compensation plans. The Compensation Committee is responsible to ensure that an annual review of executive officer performance and succession planning is presented to the Board.

The Compensation Committee meets in the first quarter of each year to establish the goals and targets applicable to the executives' annual incentive compensation for the coming year, as well as to determine the results for the year just ended. In 2011, annual equity compensation decisions for executive officers were made on April 26, 2011 with the grants effective on July 15, 2011. Other compensation decisions are made throughout the year, as circumstances warrant and as described in detail in the "2011 Compensation Discussion and Analysis" above. The Committee may delegate its authority under the 2000 Stock Plan to the extent permitted by applicable law, including delegating to executive officers the authority to make awards other than to directors or executive officers.

To support its decision-making processes, the Compensation Committee accesses the advice of an independent compensation consultant with respect to the structure and competitiveness of the Company's executive compensation programs, as well as the programs' consistency with the Company's executive compensation philosophy. The Committee has the sole authority to hire and fire all outside compensation consultants providing information and advice to the Committee. During 2011, the Compensation Committee's compensation consultant was Pearl Meyer & Partners, which firm did not provide any other services to the Company. At the request of the Committee, management will make specific proposals to the Committee regarding compensation for executive officers. Management will often work with the Committee's outside consultant to ensure that the consultant has access to the appropriate information to enable the consultant to complete its analyses for the Committee. Management ensures that the consultant's invoices are paid from Company funds. The Chief Executive Officer, the Chief Financial Officer and the Executive VP HR/Legal usually participate in Compensation Committee meetings to present and discuss the material. After such a discussion, Mr. Zager and Ms. Fallon will leave the meeting, allowing the Compensation Committee time to meet alone with Ms. Puma, after which she leaves the Committee in executive session. All decisions on executive compensation are made by the Compensation Committee in executive session without Ms. Puma.

For a discussion on the Compensation Committee's actions during 2011, see the "Compensation Discussion and Analysis" above.

Nominating and Governance Committee

During 2011, the Nominating and Governance Committee was composed of Mr. Nettles (Chairman) and Mr. Hardis until after the 2011 annual meeting, when Mr. Braun joined the Committee. The Nominating and Governance Committee is responsible for identifying and nominating candidates for membership on the Board of Directors, making recommendations to the Board on non-employee director compensation and establishing governance policies for the Board and management. The Committee operates under a written charter and governance policies, copies of which are available on our website at www.axcelis.com. The Committee held four meetings in 2011. The Committee has the sole authority to hire and fire all outside consultants providing information and advice to the Committee.

Under a process established by the Nominating and Governance Committee, the Board of Directors undertakes an annual self-evaluation of Board size, function and management interaction. In addition, each Board member completes an annual self and peer performance review.

The Nominating and Governance Committee seeks new nominees for election to the Board, when necessary, through a variety of channels, including the engagement of director search firms and less formal recommendations through business and personal contacts. Director search firms engaged by the Company are paid a retainer fee to identify and screen candidates meeting specifications established by the Committee for a particular Board nominee search. Such specifications will change from one search to another based on the Committee's determination of the needs of Board composition at the time a particular search is initiated.

The Nominating and Governance Committee will evaluate any candidate recommended for nomination as a director, whether proposed by a stockholder or identified through the Committee's own search processes, about whom it is provided appropriate information. In evaluating a candidate, the Committee must, at a minimum, determine that the candidate is capable of discharging his or her fiduciary duties to the stockholders of the Company. The Committee will determine whether the particular nomination would be consistent with Axcelis' governance policies. These policies provide in part that all new candidates for election to the Board and all Board members eligible for nomination for re-election to the Board shall be evaluated on the following criteria:

- (a) such candidate or Board member's current level of, and on-going commitment to, education regarding the responsibilities of a member of a Board of Directors under standards established by the Nominating and Governance Committee;
- (b) the adequacy of such candidate or Board member's time available to commit to responsibilities as a member of the Board;
- (c) the existence of any financial relationship with the Company other than that arising as an employee of the Company, as a Board member and/or as a stockholder; and
- (d) in the case of re-election, such member's compliance with our Director Stock Ownership Guidelines.

If a candidate is presented to the Nominating and Governance Committee at a time when it has established specifications for a particular Board search, the Committee will consider whether the candidate satisfies the established specifications. More generally, the Committee will consider a candidate's skills, character, leadership experience, business experience and judgment, and familiarity with relevant industry, national and international issues in light of the backgrounds, skills and characteristics of the current Board and the needs of the Company's business. The Nominating and Governance Committee will consider a nominee's national origin or ethnicity if it contributes to Board diversity that is beneficial to the Company for business reasons. Given the portion of the Company's revenues derived from Asian customers, Board members with insight into Asian business or markets are highly valued. Finally, the Committee must consider whether a nominee (in conjunction with the existing Board members) will assist the Company in meeting the requirements of applicable law, the rules of the Securities and Exchange Commission, the NASDAQ listing standards, and the IRC regarding the independence, sophistication and skills of the members of the Board of Directors and the Audit, Compensation and Nominating and Governance committees.

In order to recommend a candidate for consideration by the Nominating and Governance Committee, a stockholder must provide the Committee with the candidate's name, background and relationship with the proposing stockholder, a brief statement outlining the reasons the candidate would be an effective director of Axcelis and information relevant to the considerations described above. Such information should be sent to the Nominating and Governance Committee of Axcelis

Technologies, Inc., 108 Cherry Hill Drive, Beverly, Massachusetts 01915, Attn: Corporate Secretary. The Committee may require further information.

Audit Committee

The Audit Committee operates under a written charter and is responsible for assisting the Board of Directors in monitoring and oversight of (1) the integrity of the Company's financial statements and its systems of internal accounting and financial controls and (2) the independence and performance of the Company's internal and independent auditors. The Audit Committee has adopted procedures for the handling of complaints regarding accounting, internal controls and auditing matters which are described in our Code of Ethics. The Audit Committee's charter and the Company's Code of Ethics are both available on our website at www.axcelis.com. The Audit Committee met eight times during 2011. The Audit Committee consisted of Mr. Jennings (Chairman) and Messrs. Fletcher and Wild, until April 26, 2011, after which the Committee consisted of Messrs. Jennings, Fletcher and Nettles until October 25, 2011 when Mr. Keithley also joined the Audit Committee.

The Board of Directors has determined that each of Messrs. Jennings, Fletcher, Nettles and Keithley are audit committee financial experts as defined by the Securities and Exchange Commission. The Board's conclusions regarding the qualifications of a director as an audit committee financial expert are based on his certification that he has (1) an understanding of generally accepted accounting principles and financial statements; (2) the ability to assess the general application of such principles in connection with the accounting for estimates, accruals and reserves; (3) experience preparing, auditing, analyzing or evaluating financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and complexity of issues that can reasonably be expected to be raised by the Company's financial statements, or experience actively supervising one or more persons engaged in such activities; (4) an understanding of internal controls and procedures for financial reporting; and (5) an understanding of audit committee functions.

For a report on the Audit Committee's actions during 2011, see the "2011 Audit Committee Report" below.

2011 Audit Committee Report

The Audit Committee schedules meetings to occur after the preparation of quarterly and annual financial statements but prior to the public release of financial results for the period. The Committee met in April, July and November of 2011, prior to the release of the financial results for the first, second and third quarters of 2011, respectively, and in February 2012, prior to the release of our 2011 year-end results. If appropriate, additional meetings may also be held during the year to address a variety of recurring and non-recurring topics, such as the Company's internal control systems, changes to the Audit Committee charter and other matters.

At all of these meetings, Axcelis' Chief Executive Officer and Chief Financial Officer were present, as were our General Counsel and our independent auditors. The Committee's agenda is established by the Committee's chairman, with input from the Company's Chief Financial Officer. Depending on the content of the meeting, the Committee holds private sessions with the Company's independent auditors, and, separately, with management, at which candid discussions of financial management, accounting and internal control issues can take place. In its executive sessions with representatives of the independent auditors, the Committee seeks to engage in a meaningful dialogue to address any questions or concerns identified by the Committee and to obtain an understanding of any questions or concerns of the auditors.

At the recommendation of the Audit Committee, the Board of Directors appointed Ernst & Young LLP as our Independent Registered Public Accounting Firm to audit our financial statements for 2011. At the 2011 annual meeting of stockholders, our stockholders ratified this appointment. The

Audit Committee discussed with our independent auditors and the Company's Chief Financial Officer overall audit scopes and plans, the results of external audit examinations, evaluations by the auditors of the Company's internal controls and the quality of the Company's financial reporting.

Management has reviewed with the Audit Committee the audited consolidated financial statements for the year ended December 31, 2011 prepared by management and audited by Ernst & Young LLP, management's assessment of the effectiveness of our internal control over financial reporting and Ernst & Young LLP's evaluation of our internal control over financial reporting. In addition, the Committee discussed with the independent auditors the matters required to be discussed by Statement on Accounting Standard No. 61, *Communication with Audit Committees*, as adopted by the Public Company Accounting Oversight Board ("PCAOB") in Rule 3200T, and received from the independent auditors their annual written reports covering matters required to be discussed by the auditors with the Committee under the PCAOB's Ethics and Independence Rule 3526, *Communication with Audit Committees Concerning Independence*. These items were discussed with the auditors and management at an Audit Committee meeting, including a discussion of any relationship that may impact the objectivity and independence of our auditors and whether the provision of any non-audit services by the auditors is compatible with maintaining their independence. The review included a discussion of the quality, not just the acceptability, of the accounting principles, the reasonableness of significant judgments, and the clarity of disclosures in the financial statements.

In reliance on these reviews and discussions, and the report of our Independent Registered Public Accounting Firm, the Audit Committee recommended to the Board of Directors that such audited financial statements be included in the Company's 2011 Annual Report on Form 10-K for filing with the Securities and Exchange Commission and in the Annual Report to Stockholders which accompanies this proxy statement.

The Committee and the Board have also recommended, subject to reconsideration in the absence of stockholder ratification, the selection of the Company's independent auditors for the current year, as discussed above under "Proposal 3: Ratification of the Appointment of Our Independent Registered Public Accounting Firm."

In performing all of these functions, the Audit Committee acts only in an oversight capacity. Necessarily, in its oversight role, the Committee relies on the work and assurances of the Company's management, which has the primary responsibility for financial statements and reports, and of the independent auditors, who in their report on the audited annual financial statements, express an opinion on the conformity of the Company's annual financial statements to accounting principles generally accepted in the United States.

By the Audit Committee,

William C. Jennings, Chairman
R. John Fletcher
H. Patrick Nettles
Joseph P. Keithley

Code of Ethics

Axcelis has set forth its policy on ethical behavior in a document called "Ethical Business Conduct at Axcelis." This policy applies to the members of our Board of Directors and all employees, including (but not limited to) our principal executive officer, principal financial officer, principal accounting officer or controller and persons performing similar functions. This policy comprises written standards that are reasonably designed to deter wrongdoing and to promote the behavior described in Item 406 of Regulation S-K promulgated by the Securities and Exchange Commission. The text of this code of ethics is posted on the Investors page of our website at www.axcelis.com, where we may also disclose any amendments to and waivers of the code.

Certain Relationships and Related Transactions

The governance rules of NASDAQ require the Company to conduct an appropriate review of all related party transactions which are disclosable under Item 404 of Regulation S-K. In its charter, the Nominating and Governance Committee is given responsibility to review and approve any such related party transactions, including (a) business arrangements between the Company and directors or their affiliates or between the Company and employees, other than compensation for service as a director or as an employee of the Company, and (b) any other relationships between a director or employee and the Company or a third party (including membership on the boards of directors of a third party) which create the appearance or reality of a current or potential conflict of interest.

Axcelis reviews all relationships and transactions reported to it in which the Company and our directors and executive officers or their immediate family members are participants to determine whether such persons have a direct or indirect material interest. The Company's General Counsel is primarily responsible for the development and implementation of processes and controls to obtain information from the directors and executive officers with respect to related person transactions and for then determining, based on the facts and circumstances, whether the Company or a related person has a direct or indirect material interest in the transaction. As required under SEC rules, transactions that are determined to be directly or indirectly material to the Company or a related person are disclosed in the Company's proxy statement. In addition, the Nominating and Governance Committee reviews and approves or ratifies any related person transaction that is required to be disclosed. In the course of its review and approval or ratification of a disclosable related party transaction, the Nominating and Governance Committee considers:

- the nature of the related person's interest in the transaction;
- the material terms of the transaction, including, without limitation, the amount and type of transaction;
- the importance of the transaction to the related person;
- the importance of the transaction to the Company;
- whether the transaction would impair the judgment of a director or executive officer to act in the best interest of the Company; and
- any other matters the Committee deems appropriate.

Any member of the Nominating and Governance Committee who is a related person with respect to a transaction under review may not participate in the deliberations or vote respecting approval or ratification of the transaction, provided, however, that such director may be counted in determining the presence of a quorum at a meeting of the Committee that considers the transaction.

During 2011, no related person transactions requiring disclosure in the proxy statement were identified or submitted to the Nominating and Governance Committee for approval. As discussed

above under "Board of Directors Independence and Meetings," the Company had arms-length commercial dealings with a company of which Mr. Hardis is a director, which are not material individually or in the aggregate.

OTHER MATTERS

Stockholder Communications to the Directors

Security holders may communicate with the Axcelis Board of Directors by mailing a communication to the entire Board or to one or more individual directors in care of the Corporate Secretary, Axcelis Technologies, Inc., 108 Cherry Hill Drive, Beverly, Massachusetts 01915. All communications from security holders to Board members (other than communications soliciting the purchase of products and services) will be promptly relayed to the Board members to whom the communication is addressed.

Compensation Committee Interlocks and Insider Participation

During 2011, the Compensation Committee of the Board of Directors consisted of Mr. Hardis, Mr. Fletcher and Mr. Thompson, as Chairman, none of who has been an officer or employee of Axcelis or had a relationship during 2011 requiring disclosure under Item 404 of Regulation S-K.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Exchange Act requires our directors, executive officers and persons owning more than 10% of our registered equity securities to file with the SEC reports of their initial ownership and of changes in their ownership of our common stock and to provide us with copies of all Section 16(a) reports they file.

To our knowledge, based solely on our review of copies of reports furnished to us and written representations that no other reports were required, during 2011, our directors, officers, and 10% stockholders complied with all Section 16(a) filing requirements.

Deadlines for Stockholder Proposals

Assuming the 2013 annual meeting is not held more than 30 days before or 30 days after May 2, 2013, if you wish to bring business before or propose director nominations at the 2013 annual meeting, you must give written notice to Axcelis by February 1, 2013 (the date 90 days before the anniversary of the 2012 annual meeting).

If you intend to bring proposed business to the 2013 annual meeting and you would like us to consider the inclusion of your proposal in our proxy statement for the meeting, you must provide written notice to Axcelis of such proposal prior to November 26, 2012 (120 days before the anniversary date of the mailing of this proxy statement), assuming the 2013 annual meeting is not held more than 30 days before or 30 days after May 2, 2013.

Notices of stockholder proposals and nominations shall be given in writing to Axcelis Technologies, Inc., 108 Cherry Hill Drive, Beverly, Massachusetts 01915, Attn: Corporate Secretary.

Approved by the Board of Directors on February 9, 2012 for submission to Shareholders on May 2, 2012

**AXCELIS TECHNOLOGIES, INC.
2012 EQUITY INCENTIVE PLAN**

1. *Purpose.*

The purpose of the Axcelis Technologies, Inc. 2012 Equity Incentive Plan (the "Plan") is to attract and retain persons who are expected to make important contributions to the Company and its Affiliates, to provide an incentive for them to achieve the Company's goals, and to enable them to participate in the growth of the Company by granting Awards with respect to the Company's Common Stock. Certain capitalized terms used herein are defined in Section 7 below.

2. *Administration.*

The Plan shall be administered by the Committee; provided, that the Board may in any instance perform any of the functions of the Committee hereunder. The Committee shall have authority to adopt, alter and repeal such administrative rules, guidelines and practices governing the operation of the Plan as it shall from time to time consider advisable, and to interpret the provisions hereof in its discretion. The Committee's determinations hereunder shall be final and binding. The Committee may, subject to applicable law, delegate to one or more Executive Officers of the Company the power to make Awards to Participants who are not Reporting Persons or Covered Employees and all determinations hereunder with respect thereto, provided that the Committee shall fix the maximum number of shares that may be subject to such Awards.

3. *Eligibility.*

All directors and all employees and consultants of the Company or any Affiliate capable of contributing to the successful performance of the Company, other than any person who has irrevocably elected not to be eligible, are eligible to be Participants in the Plan.

4. *Stock Available for Awards.*

(a) *Amount.* Subject to adjustment under subsection 4(b), up to an aggregate of 6,000,000 shares of Common Stock may be issued pursuant to Awards, including Incentive Stock Options, under the Plan. For the purposes of counting shares hereunder:

- i. The number of shares issued as, or upon settlement of, any Award other than an Option or Stock Appreciation Right shall be multiplied by 1.5;
- ii. Outstanding shares tendered by the Participant to pay for the exercise of an Option or Stock Appreciation Right, shares repurchased in the open market by the Company, and shares that are withheld by the Company to satisfy the exercise or tax withholding obligation upon exercise of an Option may not be netted out against shares of Common Stock issued pursuant to Awards hereunder;

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- iii. Shares subject to any Award granted under this Plan that are not issued because the Award expires, is terminated unexercised or is forfeited, in whole or in part, may be subject to new Awards without being deemed to exceed such maximum amount;
- iv. Shares that are not issued under an award that is outstanding under the 2000 Stock Plan as of the Effective Date because such award expires, is terminated unexercised or is forfeited may be subject to new Awards under this Plan (other than Incentive Stock Options), without being deemed to exceed such maximum amount; and
- v. Shares issued under this Plan as a result of the assumption or substitution of outstanding grants from an acquired company shall not be deemed to exceed such maximum amount.

Shares issued under the Plan may consist of authorized but unissued shares or treasury shares

(b) *Adjustments.* Upon any equity restructuring, whether a stock dividend, recapitalization, split-up or combination of shares, or otherwise, the number of shares in respect of which Awards may be made under the Plan, the number of shares subject to outstanding Awards, the exercise, purchase or conversion price with respect to any Award, and the limit on individual grants in subsection 5(c) shall be proportionately adjusted, provided that the number of shares subject to any Award shall always be a whole number. In the event the Committee determines that any other reorganization, recapitalization, merger, spin-off or other corporate transaction affects the Common Stock such that an adjustment is required in order to preserve the benefits intended to be provided by the Plan, the Committee shall equitably adjust any or all of the number and kind of shares in respect of which Awards may be made under the Plan, the number and kind of shares subject to outstanding Awards, the exercise, purchase or conversion price with respect to any Award, and the limit on individual grants in subsection 5(c), provided that the number of shares subject to any Award shall always be a whole number. If considered appropriate, the Committee may make provision for a cash payment with respect to all or part of an outstanding Award instead of or in addition to any such adjustment. Any adjustment made pursuant to this subsection shall be subject, in the case of Incentive Stock Options, to any limitation required under the Code.

5. *Awards under the Plan.*

(a) *Types of Awards.* The Committee may grant Options, Stock Appreciation Rights, Restricted Stock, Restricted Stock Units, Stock Equivalents, and Awards of shares of Common Stock that are not subject to restrictions or forfeiture. The effectiveness of any such grant may be conditioned on the passage of time, the achievement of any Performance Goals, or the happening of any other event.

(b) *Terms and Conditions of Awards.*

(i) *Participants; Terms.* The Committee shall select the Participants to receive Awards and determine the terms and conditions of each Award. Without limiting the

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foregoing but subject to the other provisions of the Plan and applicable law, the Committee shall determine (A) the number of shares of Common Stock subject to each Award or the manner in which such number shall be determined, (B) the price, if any, a Participant shall pay to receive or exercise an Award or the manner in which such price shall be determined, (C) the time or times when an Award may vest or be exercised, settled, or transferred, (D) any Performance Goals, restrictions or other conditions to vesting, exercise, settlement, or transferability of an Award, (E) whether an Award may be settled in the form of cash, Common Stock or other securities of the Company, Awards or other property, and the manner of calculating the amount or value thereof, (F) the duration of any Restricted Period or any other circumstances in which an Award may be forfeited to the Company, (G) the effect on an Award of the disability, death, retirement or other termination of employment or other service of a Participant, and (H) the extent to which, and the period during which, the Participant or the Participant's legal representative, guardian or Designated Beneficiary may receive payment of an Award or exercise rights thereunder. Except as otherwise provided hereby or in a particular Award, any determination or action with respect to an Award may be made or taken by the Committee at the time of grant or at any time thereafter.

(ii) *Options and Stock Appreciation Rights.* Incentive Stock Options may only be granted to persons eligible to receive such Options under the Code. The exercise price for any Option or Stock Appreciation Right shall not be less than 100% of the Fair Market Value of the Common Stock on the Date of Grant; provided that Options granted in substitution for options granted by a former employer to persons who become eligible to receive Awards hereunder as a result of a transaction described in Section 424(a) of the Code may, consistent with such Section, have a lower exercise price. No Option or Stock Appreciation Right shall have a term longer than seven (7) years. No Incentive Stock Option may be granted more than ten years after the Effective Date. The Committee shall determine the manner of calculating the excess in value of the shares of Common Stock over the exercise price of a Stock Appreciation Right.

(iii) *Restricted Stock and Restricted Stock Units.* Shares of Restricted Stock and shares subject to Restricted Stock Units may not be sold, assigned, transferred, pledged or otherwise encumbered, except as permitted by the Committee, during the applicable Restricted Period. Restricted Stock Units may be settled in shares of Common Stock or cash as determined by the Committee.

(iv) *Minimum Vesting Requirements.* Notwithstanding Sections 5(b)(i) or Section 6(e), with respect to Awards to Executive Officers:

(A) vesting, settlement, or lapse of forfeiture restrictions that is solely based on continued employment, service or the passage of time shall occur (A) with respect to no more than one-third of the shares subject to such Award per year and (B) over not less than four years from the date of grant with respect to the full number of shares subject to such Award; and

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(B) vesting, settlement, or lapse of forfeiture restrictions that is based on the achievement of Performance Goals shall occur based on a Performance Period of at least one year;

provided that the foregoing limitations shall not (1) apply to vesting, settlement, or lapse of forfeiture restrictions in connection with the termination of employment or other service of a Participant by the Company or due to the Participant's disability, death or retirement nor (2) preclude the Committee from (x) exercising its discretion to accelerate the vesting of any Award upon a Transaction as contemplated by Section 5(b)(viii), (y) establishing a shorter vesting schedule for consultants or newly-hired employees, or (z) establishing a shorter schedule for vesting, settlement, or lapse of forfeiture restrictions on Awards that are granted in exchange for or in lieu of the right to receive the payment of an equivalent amount of salary, bonus or other compensation.

(v) *Payment of Exercise Price.* The Committee shall determine the form of consideration and manner of payment of the exercise price, if any, of any Award. Without limiting the foregoing, the Committee may, subject to applicable law, permit such payment to be made in whole or in part in cash or by surrender of shares of Common Stock (which may be shares retained from the respective Award or any other Award) valued at their Fair Market Value on the date of surrender, or such other lawful consideration, including a payment commitment of a financial or brokerage institution, as the Committee may determine. The Company may accept, in lieu of actual delivery of stock certificates, an attestation by the Participant in form acceptable to the Committee that he or she owns of record the shares to be tendered free and clear of claims and other encumbrances.

(vi) *Dividends.* In the discretion of the Committee, any Award may provide the Participant with dividends or dividend equivalents payable (in cash, in shares of Common Stock, or in the form of Awards under the Plan) currently or deferred and with or without interest; provided that any dividend paid or issued with respect to any portion of an Award of Restricted Stock and any dividend equivalent paid or issued with respect to any portion of any other Award shall be subject to the same restrictions (including risk of forfeiture) as such Restricted Stock or other Award, respectively, until the end of the respective Restricted Period or such portion has otherwise vested.

(vii) *Termination and Forfeiture.* The terms of any Award may include such continuing provisions for termination of the Award and/or forfeiture or recapture of any shares, cash or other property previously issued pursuant thereto relating to competition or other activity or circumstances detrimental to the Company as the Committee may determine to be in the Company's best interests. Without limiting the foregoing, the terms of any Award shall be subject to, and shall be deemed automatically amended to incorporate, any "clawback," "recapture," or similar policy adopted by the Company and in effect before or after the grant of such Award.

(viii) *Certain Extraordinary Transactions.* The Committee may in its discretion provide, at the time of grant or at any time thereafter, that in the case of any recapitalization,

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stock acquisition, merger, consolidation or other form of corporate transaction in which a company other than the Company is the surviving, continuing, successor or purchasing entity (a "Transaction"), the surviving, continuing, successor or purchasing entity or a parent or subsidiary of such entity may, without the consent of the Participant, assume the Company's rights and obligations under any Award or portion thereof outstanding immediately before the Transaction or substitute for any such outstanding Award or portion thereof a substantially equivalent award with respect to such entity's own stock or other property or cash, in either case with equitable adjustments in the number and type of shares or other assets subject to the Awards and the exercise, purchase or conversion price with respect to any Award, in light of the consideration received by the Company's stockholders in the Transaction. Any such Award that is not so assumed or substituted for shall terminate upon the consummation of such Transaction on such terms, if any, as the Committee shall provide. Notwithstanding the foregoing, if the stockholders of the Company receive consideration that is all or predominantly cash in exchange for their shares of common Stock in a Transaction, then, in order to preserve the Participants' rights under outstanding Awards, the Committee shall, without the need for consent of any Participant, either (A) cause any unexercisable or unvested portion of an Award outstanding immediately before the Transaction to become fully exercisable and vested prior to such Transaction (but effective only on consummation of the Transaction), and any Options and Stock Appreciation Rights that have not been exercised as of the consummation of the Transaction shall thereupon terminate or (B) provide for payment to the Participant of cash, stock of another entity party to the Transaction, or other property with a Fair Market Value equal to the amount, if any, that would have been received upon the vesting, exercise, settlement, or transferability of the Award had any unexercisable or unvested portion of the Award become fully exercisable and vested and the Award been exercised or paid in connection with the Transaction, reduced (but not below zero) by the exercise or purchase price per share, if any, under such Award, whereupon the Award shall terminate. If any portion of such consideration may be received by Company's stockholders in the Transaction on a contingent or delayed basis, the Committee may, in its sole discretion, determine such Fair Market Value per share as of the time of the Transaction on the basis of the Committee's good faith estimate of the present value of the probable amount of future payment of such consideration.

In the event of a recapitalization, stock acquisition, merger, consolidation or other form of corporate transaction in which the Company is the surviving, continuing, successor or purchasing entity, the Committee may make equitable adjustments to outstanding Awards pursuant to Section 4(b).

(ix) *Documentation.* Each Award under the Plan shall be evidenced by documentation in the form prescribed from time to time by the Committee and delivered to or executed and delivered by the Participant specifying the terms and conditions of the Award and containing such other terms and conditions not inconsistent with the provisions hereof as the Committee considers necessary or advisable to achieve the purposes of the Plan or to comply with applicable law and accounting principles. Any such documentation may be maintained solely in electronic format.

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(x) *In General.* Any Award may be made alone, in addition to, or in relation to any other Award. The terms of Awards of each type need not be identical, and the Committee need not treat Participants uniformly. No Award shall be transferable except upon such terms and conditions and to such extent as the Committee determines, provided that no Award shall be transferable for value and Incentive Stock Options may be transferable only to the extent permitted by the Code. No Award to any Participant subject to United States income taxation shall provide for the deferral of compensation that does not comply with Section 409A of the Code. The achievement or satisfaction of any Performance Goals, restrictions or other conditions to vesting, exercise, settlement, or transferability of an Award shall be determined by the Committee.

(c) *Limit on Individual Grants.* The maximum number of shares of Common Stock subject to Options, Stock Appreciation Rights and other Awards intended to satisfy the requirements for "performance-based compensation" within the meaning of Section 162(m) of the Code that may be granted to a Participant in any fiscal year may not exceed 1,250,000 shares, subject to adjustment under subsection 4(b). In the case of any performance-based Awards settled in cash, no more than \$1,000,000 may be paid to any Participant with respect to any one year of a Performance Period.

6. *General Provisions.*

(a) *Tax Withholding.* A Participant shall pay to the Company, or make provision satisfactory to the Committee for payment of, any taxes required by law to be withheld in respect of Awards under the Plan no later than the date of the event creating the tax liability. The Company and its Affiliates may, to the extent permitted by law, deduct any such tax obligations from any payment of any kind due to the Participant under the Plan or otherwise. In the Committee's discretion, the minimum tax obligations required by law to be withheld in respect of Awards may be paid in whole or in part in shares of Common Stock, including shares retained from the Award creating the tax obligation, valued at their Fair Market Value on the date of retention or delivery.

(b) *Legal Compliance.* The Company shall not be required to issue any shares of Common Stock or take any other action pursuant to the Plan unless the Company is satisfied that all requirements of law, or of any stock exchange on which the Common Stock is then listed, in connection therewith have been or will be complied with, and the Committee may impose any restrictions on the rights of Participants hereunder as it shall deem necessary or advisable to comply with any such requirements.

(c) *Foreign Nationals.* Awards may be made to Participants who are foreign nationals or employed outside the United States on such terms and conditions different from those specified herein as the Committee considers necessary or advisable to achieve the purposes of the Plan or to comply with applicable laws.

(d) *Awards Not Includable for Benefit Purposes.* Awards and other payments received by a Participant pursuant to the provisions of the Plan shall not be included in the determination of

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benefits under any pension, group insurance or other benefit plan applicable to the Participant which is maintained by the Company or any of its Affiliates, except as may be provided under the terms of such plans or determined by the Board.

(e) *Amendment of Awards.*

(i) Subject to clauses (ii) and (iii) below, the Committee may amend, modify or terminate any outstanding Award, including without limitation changing the dates of vesting, exercise or settlement, causing the Award to be assumed by another entity, and substituting therefor another Award of the same or a different type, provided that the Participant's consent to such action shall be required unless the terms of this Plan or the Award permit such

action, the Committee determines that such action is required by law or stock exchange rule, or the Committee determines that the action, taking into account any related action, would not materially and adversely affect the Participant.

(ii) Notwithstanding the attainment of Performance Goals in the case of any Award intended to satisfy the requirements for “performance-based compensation” within the meaning of Section 162(m) of the Code, the Committee may reduce (but not increase) the amount payable at a given level of performance to take into account additional factors that the Committee may deem relevant.

(iii) The foregoing notwithstanding, without further approval of the stockholders of the Company, the Committee shall not authorize the amendment of any outstanding Option or Stock Appreciation Right to reduce the exercise price and no Option or Stock Appreciation Right shall be canceled and replaced with an Award exercisable for Common Stock at a lower exercise price.

7. *Certain Definitions.* As used in this Plan:

“Affiliate” means any business entity in which the Company owns directly or indirectly 50% or more of the total voting power or has a significant financial interest as determined by the Committee.

“Award” means any award of shares of Common Stock or right with respect to shares described in Section 5(a).

“Board” means the Board of Directors of the Company.

“Code” means the Internal Revenue Code of 1986, as amended from time to time, or any successor law.

“Committee” means one or more committees appointed by the Board to administer the Plan or a specified portion thereof. Each such committee shall be comprised of not less than two members of the Board who shall meet such criteria as the Board may specify from time to time.

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“Common Stock” means the Common Stock, \$0.001 par value, of the Company.

“Company” means Axcelis Technologies, Inc., a Delaware corporation.

“Covered Employee” means a “covered employee” within the meaning of Section 162(m) of the Code.

“Date of Grant” means the date on which all requirements under applicable law and the Company’s certificate of incorporation and bylaws for the effective grant of an Award have been satisfied.

“Designated Beneficiary” means the beneficiary designated by a Participant, in a manner determined by the Committee, to receive amounts due or exercise rights of the Participant in the event of the Participant’s death. In the absence of an effective designation by a Participant, “Designated Beneficiary” means the Participant’s legal representative.

“Effective Date,” from time to time, means the most recent date that the Plan was adopted or, if earlier, that it was approved by the stockholders (including approval of the Plan as amended), as such terms are used in the regulations under Section 422 of the Code.

“Exchange Act” means the Securities Exchange Act of 1934, as amended from time to time, or any successor law.

“Executive Officer” has the meaning given in Rule 3b-7 under the Exchange Act, or any successor provision.

“Fair Market Value” with respect to the Common Stock or other property means the fair market value thereof determined by such methods as shall be established by the Committee from time to time. Unless otherwise determined by the Committee in good faith, the per share Fair Market Value of the Common Stock as of any date shall mean (a) if the Common Stock is then listed or admitted to trading on a national securities exchange, (i) the last reported sale price on such date on the principal national securities exchange on which the Common Stock is then listed or admitted to trading, (ii) if no such reported sale took place on such date, the average of the closing bid and asked prices on such exchange on such date, or (iii) if neither (i) nor (ii) applies, the last reported sale price on the next preceding date on which trading took place, or (b) if the Common Stock is then traded in the over-the-counter market, the average of the closing bid and asked prices on such date, as reported by The Wall Street Journal or other appropriate publication selected by the Committee, for the over-the-counter market.

“Incentive Stock Option” means an Option complying with the requirements of Section 422 of the Code or any successor provision and any regulations thereunder.

“Option” means a right to purchase shares of Common Stock and may be an Incentive Stock Option if specified by the Committee.

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“Participant” means a person selected by the Committee to receive an Award under the Plan.

“Performance Goals” means, in the case of Awards intended to satisfy the requirements for “performance-based compensation” within the meaning of Section 162(m) of the Code, one or more objective performance goals established by the Committee, based on one or more of the following criteria: revenue; revenue growth; sales; expenses; margins; net income; earnings or earnings per share; cash flow; stock price; shareholder return; return on investment; return on invested capital, assets, or equity; profit before or after tax; operating profit; operating margin; return on research and development investment; market capitalization; quality improvements; market share; cycle time reductions; customer satisfaction measures; strategic positioning or marketing programs; market penetration or expansion; business / information systems improvements; expense management; infrastructure support programs; human resource programs; customer programs; technology development programs; goals relating to acquisitions or divestitures, or any combination of the

foregoing, including without limitation goals based on any of such measures relative to peer groups or market indices, and may be particular to a Participant or may be based, in whole or in part, on the performance of the division, department, line of business, subsidiary, or other business unit, whether or not legally constituted, in which the Participant works or on the performance of the Company generally.

“Performance Period” means any period of service of at least one year designated by the Committee as applicable to an Award intended to satisfy the requirements for “performance-based compensation.”

“Reporting Person” means a person subject to Section 16 of the Exchange Act.

“Restricted Period” means any period during which an Award or any part thereof may be forfeited to the Company.

“Restricted Stock” means shares of Common Stock that are subject to forfeiture to the Company.

“Restricted Stock Unit” means the right, subject to forfeiture, to receive the value of a share of Common Stock in the future, payable in the form of cash, Common Stock or other securities of the Company, Awards or other property, and is an unfunded and unsecured obligation of the Company.

“Stock Appreciation Right” means the right to receive any excess in value of shares of Common Stock over the exercise price of such right.

“Stock Equivalent” means the right to receive payment from the Company based in whole or in part on the value of the Common Stock, payable in the form of cash, Common Stock or other securities of the Company, Awards or other property, and may include without limitation phantom stock, performance units, and Stock Appreciation Rights.

“Termination of employment or other service of a Participant” means the voluntary or involuntary termination of a Participant’s employment with the Company or an Affiliate for any reason, including death, disability, retirement or as the result of the divestiture of the Participant’s employer or any similar transaction in which the Participant’s employer ceases to be the Company or one of its Affiliates. Whether entering military or other government service shall constitute “termination of employment or other service,” or whether a “termination of employment or other service” shall occur as a result of disability, shall be determined in each case by the Committee in its sole discretion before or after the grant of the respective Award. In the case of a member of the Board or consultant who is not an employee of the Company or an Affiliate, “termination of employment or other service” shall mean the voluntary or involuntary termination of Board service or the consulting relationship, as the case may be, for any reason.

“Transferable for value” means a transfer on terms that would prevent the Company from relying on Securities and Exchange Commission Form S-8 (or any successor form) with respect to the issuance of the Common Stock underlying the respective Award.

8. *Miscellaneous.*

(a) *No Rights with Respect to Service.* No person shall have any claim or right hereunder to be granted an Award. Neither the adoption, maintenance, or operation of the Plan nor any Award hereunder shall confer upon any person any right with respect to the continuance of his or her employment by or other service with the Company or any Affiliate nor shall they interfere with the rights of the Company or any Affiliate to terminate or otherwise change the terms of such service at any time, including, without limitation, the right to promote, demote or otherwise re-assign any person from one position to another within the Company or any Affiliate. Unless the Committee otherwise provides in any case, the service of a Participant with an Affiliate shall be deemed to terminate for purposes of the Plan when such Affiliate ceases to be an Affiliate of the Company.

(b) *No Rights as Stockholder.* Subject to the provisions of the applicable Award, no Participant or Designated Beneficiary shall have any rights as a stockholder with respect to any shares of Common Stock to be issued under the Plan until he or she becomes the holder thereof. A Participant to whom Common Stock is awarded will be considered the holder of such Common Stock at the time of the Award, except as otherwise provided in the applicable Award.

(c) *Amendment of Plan.* The Board may amend, suspend or terminate the Plan or any portion thereof at any time, subject to such stockholder approval as the Board determines to be necessary or advisable to comply with any tax or regulatory requirement.

2012 Annual Meeting Admission Ticket

2012 Annual Meeting of
Axcelis Technologies, Inc. Stockholders
Wednesday, May 2, 2012, 11:00 am EST
108 Cherry Hill Drive
Beverly, MA 01915

Upon arrival, please present this admission ticket
and photo identification at the registration desk.

Directions to Axcelis Technologies, Inc. headquarters at 108 Cherry Hill Drive, Beverly, MA

From Boston's Logan Airport: On leaving Boston's Logan Airport, take Route 1A north for 3 miles. Turn left onto Route 60 West for 2 miles. At the 2nd rotary, take Route 1 North for 6.6 miles. Exit onto Routes 95/128 North toward Gloucester.

From Route 128 North: Take Route 128 North to Exit 22 W. At bottom of exit ramp, take a right onto Route 62. Take your first right onto State Road, bear right at fork onto Conant Street. Follow Conant Street past the Cherry Hill Creamery on left and take a left onto Cherry Hill Drive. 108 Cherry Hill Drive is the first building on your right.

▼ IF YOU HAVE NOT VOTED VIA THE INTERNET OR TELEPHONE, FOLD ALONG THE PERFORATION, DETACH AND RETURN THE BOTTOM PORTION IN THE ENCLOSED ENVELOPE. ▼



Proxy — Axcelis Technologies, Inc.

Notice of 2012 Annual Meeting of Stockholders

108 Cherry Hill Drive, Beverly, MA 01915

Proxy Solicited by Board of Directors for Annual Meeting — Wednesday, May 2, 2012

Mary G. Puma, Jay Zager, Lynnette C. Fallon, or any of them, each with the power of substitution, are hereby authorized to represent and vote the shares of the undersigned, with all the powers which the undersigned would possess if personally present, at the Annual Meeting of Stockholders of Axcelis Technologies, Inc. to be held on May 2, 2012 or at any postponement or adjournment thereof.

Shares represented by this proxy will be voted by the stockholder. If no such directions are indicated, the Proxies will have authority to vote FOR all nominees, FOR Proposals 2, 3 and 4.

In their discretion, the Proxies are authorized to vote upon such other business as may properly come before the meeting.

(Items to be voted appear on reverse side.)