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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 Pursuant to §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:

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 - (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):

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**NOTICE OF ANNUAL MEETING OF STOCKHOLDERS
to Be Held May 1, 2008**

The 2008 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 Thursday, May 1, 2008 for the following purposes:

1. To elect three (3) directors to serve until the 2011 annual meeting of stockholders.
2. To ratify the appointment of our independent registered public accounting firm to audit our financial statements for the year ending December 31, 2008.
3. To consider a proposal to amend our Certificate of Incorporation to provide for the annual election of directors.
4. 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 14, 2008 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,

Dated: April [1], 2008

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

Lynnette C. Fallon
Secretary

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 2008 annual meeting of stockholders to be held on Thursday, May 1, 2008 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 April [1] 2008.

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 14, 2008. On that date, there were _____ 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 your shares either by proxy or by attending the meeting and voting in person. If you choose to vote by proxy, please complete, date, sign and return the proxy card in the enclosed postage prepaid envelope. 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 proposals one and two, as recommended by our Board of Directors. On proposal three, the proxies will abstain from voting unless a signed proxy card indicates how the votes should be cast. 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 reelection of three directors whose current terms end in 2008, the ratification of the selection of independent auditors of the Company and a proposal regarding the amendment of our Certificate of Incorporation.

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 number of votes required to approve the proposals that are scheduled to be presented at the meeting is as follows:

Proposal	Required Vote
• Election of three nominees as directors	Each nominee must receive a plurality of the votes cast.
• Ratification of the appointment of our independent registered public accounting firm (our "independent auditors") to audit our financial statements for 2008	This requires the affirmative vote of a majority of the votes cast.
• Approval of the amendments to our Certificate of Incorporation to provide for the annual election of directors	This requires the affirmative vote of 75% of the shares of common stock entitled to vote at the meeting.

Abstentions. Abstaining from voting for a nominee in the election of directors or on the proposal to ratify the appointment of our auditors 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. The proposal to amend the Certificate of Incorporation requires the approval of a majority of shares outstanding, so abstaining on that proposal will reduce the number of shares in favor without reducing the number of shares required for approval and so will impact 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 both the election of directors and ratification of auditors, but not on the proposal to amend the Certificate of Incorporation. 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 ratification of the appointment of the independent auditors. Broker non-votes will have the same effect as an abstention with respect to the proposal to amend the Certificate of Incorporation.

Discretionary voting by proxies on other matters. Aside from the proposals for the election of directors, the ratification of our selection of auditors and the stockholder proposal described herein, we do not know of any other proposals that may be presented at the 2008 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, 2007 (except as otherwise indicated in the footnotes) by persons known by us to own more than 5% of our common stock.

Beneficial Owner(1)	Shares Owned	Percent of Class
FMR LLC and Edward C. Johnson 3rd(2) 82 Devonshire Street, Boston, MA 02109	13,319,104	12.99%
Sterling Capital Management LLC(3) 4064 Colony Road, Suite 200, Charlotte, NC 28211	12,231,875	11.93%
Donald Smith & Co., Inc.(4) 152 West 57th Street, New York, NY 10019	10,196,600	9.94%
Tradewinds Global Investors, LLC(5) 2049 Century Park East, 20 th floor, Los Angeles, CA 90067	9,247,196	9.02%
Dimensional Fund Advisors LP(6) 1299 Ocean Avenue Santa Monica CA 90401	8,463,135	8.25%
Barclays Global Investors, NA and Barclays Global Fund Advisors(7) 45 Fremont Street, San Francisco, CA 94105		
Barclays Global Investors, Ltd. Murray House, 1 Royal Mint Court, London EC3N 4HH, England	5,190,997	5.06%

- (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, 2007 (102,564,753 shares).
- (2) Based on a Schedule 13G/A filed with the Securities and Exchange Commission in February 2008 reporting on ownership as of December 31, 2007, which states that Fidelity Management & Research Company ("Fidelity"), a wholly-owned subsidiary of FMR LLC, is the beneficial owner of 13,319,104 shares. Such beneficial ownership is the result of Fidelity acting as investment advisor to various investment companies, including Fidelity Low Priced Stock Fund (the "Fund"), which holds 9,170,004 of such shares (8.96% of the class). According to the Schedule 13G/A, Edward C. Johnson 3d and FMR LLC, through its control of Fidelity and the investment companies, each have sole dispositive power over the shares held by Fidelity, but no voting power. Fidelity votes these shares pursuant to guidelines of the investment companies' trustees. Fidelity and the Fund are located at the same address as FMR LLC.
- (3) Based on a Schedule 13D/A filed with the Securities and Exchange Commission on February 11, 2008 reporting on ownership as of that date. This filing states that such shares are owned by advisory clients of Sterling Capital Management LLC.
- (4) Based on a Schedule 13G filed with the Securities and Exchange Commission in February 2008 reporting on ownership as of December 31, 2007, 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 7,832,500 of such shares and the sole power to dispose of all of such shares.
- (5) Based on a Schedule 13G/A filed with the Securities and Exchange Commission in February 2008 reporting on ownership as of December 31, 2007, which states that such shares are owned by advisory clients of Tradewinds Global Investors, LLC. According to the Schedule 13G, Tradewinds Global Investors, LLC has sole voting power over 8,231,801 of such shares and the sole power to dispose of all of such shares.

- (6) Based on a Schedule 13G filed with the Securities and Exchange Commission in February 2008 reporting on ownership as of December 31, 2007, which states that such shares are owned by advisory clients of Dimensional Fund Advisors LP.
- (7) Based on a Schedule 13G filed with the Securities and Exchange Commission in February 2008 reporting on ownership as of December 31, 2007, which states that such shares are held by the Barclays banks and investment adviser named above in trust accounts for the economic benefit of the beneficiaries of those accounts. According to the Schedule 13G, such companies collectively have sole voting power over 3,880,080 such shares and the sole power to dispose of all of such shares.

SHARE OWNERSHIP OF DIRECTORS AND EXECUTIVE OFFICERS

The following table shows the amount of our common stock beneficially owned as of March 1, 2008 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.

Beneficial Owner(1)	Shares Owned	Shares Subject to Exercisable Rights to Acquire as of April 30, 2008(2)	Total Shares Beneficially Owned	Percent of Class
Non-Executive Directors				
R. John Fletcher	48,693	55,000	103,693	*
Stephen R. Hardis	152,428	100,000	252,428	*
William C. Jennings	36,963	55,000	91,963	*
Patrick H. Nettles	43,193	85,000	128,193	*
H. Brian Thompson	36,693	85,000	121,693	*
Geoffrey Wild	16,103	40,000	56,103	*
Named Executive Officers				
Mary G. Puma(3)	102,272	1,493,669	1,595,941	1.5%
Stephen G. Bassett	19,113	63,750	82,863	*
Lynnette C. Fallon	25,104	226,500	251,604	*
Matthew P. Flynn	17,113	96,787	113,900	*
Kevin J. Brewer	13,882	116,868	130,750	*
All current Executive Officers and Directors as a Group(13 persons)(4)	526,864	2,560,349	3,087,213	3.1%

* 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 April 30, 2008 (60 days after March 1, 2008) 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 1, 2008 (shares), plus any shares that person could acquire upon the exercise of any options or other rights on or before April 30, 2008.
- (2) Concurrently with the acceleration of vesting of certain stock options effective December 15, 2005, executive officers agreed not to sell affected options until they would otherwise vest in accordance with their original terms. Of the shares listed as subject to options exercisable as of April 30, 2008, the following shares will on such date remain subject to these lock up agreements: Ms. Puma—25,000 shares; Mr. Bassett—625 shares; Ms. Fallon—7,500 shares; Mr. Flynn—3,750 shares; Mr. Brewer—3,750 shares; and all current executive officers—43,750 shares.
- (3) Ms. Puma's ownership includes 20,000 shares owned by her husband.
- (4) Includes shares and exercisable options held by the directors and named executive officers, as well as two other executive officers who beneficially own an aggregate of 15,307 shares and 142,775 exercisable options.

PROPOSAL 1: ELECTION OF DIRECTORS

Our Board of Directors has fixed the number of directors at seven. The number of directors is subject to increase or decrease by action of the Board. Under our charter, our Board is divided into three classes as nearly equal in number of directors as possible. At the Annual Meeting, the stockholders will consider an amendment to the Company's Certificate of Incorporation which would eliminate the classified Board, commencing at the 2009 Annual Meeting. Under the charter currently in effect, as the term of one class expires, their successors are elected for a term of three years, at each annual stockholders' meeting. At the upcoming annual meeting, three directors will be elected to hold office for a term of three years until our annual meeting in 2011 and until their successors are elected and qualified. Each of the Board's nominees, R. John Fletcher, Stephen R. Hardis and H. Brian Thompson, 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 three nominees.

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

Name and Age	Business Experience and Other Directorships	Director Since	Present Term Expires
*R. John Fletcher Age: 62	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 fund. Prior to founding Fletcher Spaght, Inc., Mr. Fletcher was a manager at the Boston Consulting Group. Mr. Fletcher is also a director of AutoImmune, Inc., Spectranetics Corporation and Panacos, Inc.	2003	2008
*Stephen R. Hardis Age: 72	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 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 American Greetings Corporation, Lexmark International Group, Inc., Marsh & McLennan Companies, Inc., Nordson Corporation, and Progressive Corporation.	2000	2008

*H. Brian Thompson	<p>Mr. Thompson is Executive Chairman of Global Telecom & Technology, a Multi-Network Operator headquartered in McLean, VA, and continues to head his own private equity investment and advisory firm, Universal Telecommunications, Inc. From December 2000 to June 2007, Mr. Thompson was Chairman of Comsat International (CI), one of the largest telecommunications operators serving all of Latin America. He also served as Chairman and Chief Executive Officer of Global TeleSystems Group, Inc. from March 1999 through September 2000, and was Chairman and CEO of LCI International from July 1991 until its sale to Qwest Communications International, Inc. in June 1998. Mr. Thompson became Vice Chairman of the Board for Qwest until his resignation in December 1998.</p> <p>Mr. Thompson previously served as Executive Vice President of MCI Communications Corporation from 1981 to 1990 with responsibility for the company's eight operating divisions, including MCI International. Prior to MCI, Mr. Thompson 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 boards of directors of ICO Global Communications (Holdings) Limited, Penske Automotive Group, and Sonus Technologies, Inc.</p>	2002	2008
Age: 68			
Geoffrey Wild	<p>Mr. Wild is Chief Executive Officer and President of Cascade Microtech, Inc., a worldwide leader in the design, development and manufacture of advanced wafer probing solutions for the electrical measurement and test of semiconductor integrated circuits and chips. Mr. Wild commenced that position in January 2008. Prior to that, from 2002 through 2007, Mr. Wild was Chief Executive Officer and President of Nikon Precision, Inc., a wholly owned subsidiary of Nikon Corporation, a global supplier of lithography systems. Prior to joining Nikon, Mr. Wild was Chief Executive Officer of TheSupply, Inc., an e-commerce provider of supply chain services. Mr. Wild is also a director of Cascade Microtech, Inc. and E Ink Corporation.</p>	2006	2010
Age: 51			
Patrick H. Nettles	<p>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.</p>	2001	2010
Age: 64			

<p>William C. Jennings</p> <p>Age: 68</p>	<p>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 also a director of Silgan Holdings Inc.</p>	<p>2003</p>	<p>2009</p>
<p>Mary G. Puma</p> <p>Age: 50</p>	<p>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 a director of Nordson Corporation.</p>	<p>2000</p>	<p>2009</p>

* Indicates a nominee for election as director.

PROPOSAL 2: 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 2008 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 2007 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:

	2006	2007
Audit Fees	\$ 1,848,500	\$ 1,788,500
Audit Related Fees	\$ 11,000	\$ 13,500
Tax Fees		
Tax compliance and preparation of returns	\$ 62,890	\$ 507,714
International tax planning	\$ 220,000	\$ 134,100
General tax planning and other tax services	\$ 0	\$ 13,170
Total Tax Fees	\$ 282,890	\$ 654,984
Total Fees	\$ 2,142,390	\$ 2,456,984

Audit fees include a U.S. GAAP audit of SEN Corporation, an SHI and Axcelis Company and statutory audits for subsidiaries and branches operating in countries outside of the United States. Audit related fees include audits 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.

Our Audit Committee has adopted a policy and procedures requiring its pre-approval of all 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 pre-approves the performance of specific audit services. Management must obtain the specific prior approval of the Audit Committee for each engagement of the independent auditor to perform other audit-related or other non-audit services. The policy also 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 2006 and 2007 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 2008 notwithstanding a negative stockholder vote.

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

**PROPOSAL 3: PROPOSAL TO AMEND OUR CERTIFICATE OF INCORPORATION TO PROVIDE
FOR THE ANNUAL ELECTION OF DIRECTORS**

Proposed New Charter

The Board of Directors is submitting for consideration by the stockholders an Amended and Restated Certificate of Incorporation to provide for the phased elimination over three years of the classified board structure (the "New Charter"). The Company's current Restated Certificate of Incorporation divides the Board of Directors into three classes that are elected for staggered, three year terms. If the New Charter is approved, the directors standing for election at the 2009 annual meeting (currently expected to be Ms. Puma and Mr. Jennings) will stand for election for a one-year term expiring at the 2010 annual meeting and they and their successors would stand for one-year terms thereafter. The Board's other directors (who would not stand for election at the 2009 Annual Meeting) will continue to hold office until the end of the terms for which they were elected, and they and their successors will stand for one-year terms thereafter. Accordingly, directors elected at this year's annual meeting will serve for a three year term expiring at the annual meeting in 2011, and directors currently serving terms that end at the annual meeting in 2009 and 2010 will continue to serve for such terms. If the New Charter is approved, all directors will be elected on an annual basis commencing in 2011. In all cases, each director will hold office until his or her successor has been elected and qualified or until the director's earlier resignation or removal, and vacancies that occur during the year will be filled by the Board to serve until the next annual meeting.

If the New Charter is approved, the Company's Restated Certificate of Incorporation will be amended and restated to eliminate the classification of the board as described above, including ancillary changes to reflect the absence of a classified board. These ancillary changes include a provision that directors being elected beginning at the 2009 annual meeting and future annual meetings may be removed "without cause" by the affirmative vote of the holders of 75% of the outstanding shares. Currently, directors can only be removed "for cause" by the affirmative vote of the holders of a majority of the outstanding shares. The stockholders' right to remove a director for cause will continue unchanged. The text of the proposed Article 6 addressing the election of directors in the proposed New Charter is attached as *Appendix A* to this proxy statement. The proposed New Charter will also incorporate the terms of the Certificate of Designations of Series A Participating Preferred Stock that was filed in June 2000, as well as other immaterial formatting changes. If the New Charter is approved, the Board of Directors will also make a conforming change to the Bylaw provision for filling vacancies on the Board.

Background of Proposal

In June 2000, prior to the Company's initial public offering, the Board adopted the current Restated Certificate of Incorporation to implement provisions that were customary for a public

company, including the classification of the Board. At that time, the Board concluded that the advantages of classification of the Board outweighed the disadvantages. The considerations for and against such classification are summarized below:

Considerations Favoring a Classified Board

- Classification of the Board tends to foster continuity and stability of management and business policies.
- Classification makes it more difficult and time-consuming to change majority control of the Board, which reduces the vulnerability of the Company to an unsolicited takeover proposal. Thus, classification may encourage persons attempting certain types of transactions that involve an actual or threatened change of control of the Company to first seek to negotiate with the Company and may discourage pursuit of such transactions on a non-negotiated basis.

Considerations Against a Classified Board

- Classification of the Board could make more difficult or discourage the removal of incumbent directors, through a proxy contest or otherwise, and the assumption of control by a holder of a substantial block of the Company's common stock, and could thus have the effect of entrenching incumbent management.
- Classification could have the effect of discouraging a third party from making a tender offer or otherwise attempting to obtain control of the Company, even though such an attempt might be beneficial to the Company and its shareholders.

The considerations for and against a classified board are, in all material respects, the same today as they were in 2000. However, the Board is aware that in the intervening period, there has been an increased focus on corporate governance in general and that some institutional investors and commentators have become increasingly vocal in their objections to board classification, claiming that classification tends to reduce the accountability of directors since they are elected only once every three years.

In a reflection of this concern, at the 2007 annual meeting, a stockholder proposal to declassify the Company's board received majority support. In August 2007, after careful consideration of the relative merits of a classified board, our Board approved the New Charter for submission to the stockholders at the 2008 annual meeting. This Board action was based on the Board's conclusion that the stockholders should be afforded the opportunity to decide whether or not the Board should be classified by voting on the proposed New Charter, after weighing the considerations for and against classification. However, the Board has also determined that it should make no recommendation as to the proposed amendment because the proposal does not represent a judgment by the Board that the elimination of the classified Board is in the best interests of the stockholders. The Board believes that the considerations for and against classification can be readily evaluated by the shareholders without any recommendation by the Board.

Required Vote

For the New Charter to become effective, this proposal must receive the affirmative vote of at least 75% of the outstanding shares entitled to vote at the meeting. If the New Charter is not approved by the Company's stockholders, the present classification of the Board of Directors will continue.

The Board makes no recommendation either "FOR" or "AGAINST" the proposal to adopt the proposed Restated and Amended Certificate of Incorporation to provide for the annual election of directors.

EXECUTIVE COMPENSATION

2007 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 (Stephen G. Bassett), and the three most highly compensated other executive officers serving as executive officers at December 31, 2007 included in the Summary Compensation Table below. 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 2007.

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.

Executive compensation decision-making begins by determining the level and mix of types (base, incentive and equity) of compensation for a particular position that are paid by similar companies for comparable positions. In 2007, the Committee reviewed a report from an external compensation consultant that compared the compensation of each of the Axcelis executives against the compensation paid for similar positions in a peer group of 13 publicly traded firms which have similar products and services and generate similar revenues as Axcelis. These 13 companies, which are referred to in this discussion as the "Peer Group," are Advanced Energy Industries, Asyst Technologies, ATMI Inc., Brooks Automation Inc., Cabot Microelectronics Corp., Cymer Inc., Mattson Technology Inc., MKS Instruments Inc., Novellus Systems Inc., Photronics Inc., Semitool Inc., Teradyne Inc. and Varian Semiconductor Equipment Associates, Inc. The median revenues for the Peer Group over the 12 month period prior to the report were \$492.5 million in comparison to \$461.3 million for the Company in the same period.

The Compensation Committee sets compensation by using this information together with an evaluation of the unique education, training and experience of the executive officer and his or her overall value to the Company. Factors considered by the Compensation Committee in valuing the NEO's services include the executive's contributions to the Company's competitive position in the marketplace, individual performance, and the past and expected contribution by the executive officer toward the achievement of the Company's performance objectives. While the benchmarking information is a very important starting point, this subjective review is necessary to ensure that the level and mix of types of executive compensation is appropriate for the particular individual and will drive the performance of the executive.

All elements of an executive's 2007 compensation were reviewed in the context of the 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. The Committee had no pre-established policy or target for the allocation between

cash and non-cash compensation, short-term and long-term incentive compensation or incentive and base compensation. It determined such allocations based on the factors discussed below.

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 2007 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 competitive with base compensation the executive could earn in a similar position at other companies, 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. The process of fixing and adjusting base pay involves the Committee's review of Peer Group benchmark compensation and subjective considerations, as discussed above. Typically, the Chief Executive Officer makes recommendations to the Compensation Committee with regard to base pay for the other executive officers that she believes are justified in light of these considerations. In fixing or adjusting base pay, the Committee considers the impact increases in base pay will have on annual incentive cash compensation and equity grants, which in 2007 were based on a percentage of base pay.

Increases in executive officer base pay are only made if the Committee determines that the executive's current compensation is insufficient. This determination may be reached because the market pay for comparable positions has increased, the executive has taken on additional responsibilities, or the value of the executive to the Company has increased due to exceptional performance or changed circumstances. At its meeting in August 2007, the Compensation Committee reviewed the cash compensation of each incumbent executive, including the named executive officers. In doing so, the Committee reviewed the Peer Group report for each position and subjective factors relating to each executive. The Peer Group report showed that on average, the base compensation of the NEOs was at the 53rd percentile of the compensation paid in the Peer Group for comparable positions.

Based on these factors, in 2007 three of the named executive officers, Stephen Bassett, Matthew Flynn, and Kevin Brewer, had an adjustment in base salary, which became effective on August 18, 2007. Mr. Bassett's base pay had not changed since he joined the Company in 2003, Mr. Flynn's base pay had last been adjusted in August 2006, and Mr. Brewer's base pay had last been adjusted in May 2005. No adjustments were made in 2007 to the base pay of Ms. Puma (which was last adjusted in July 2004) or Ms. Fallon (which was last adjusted in January 2004). In 2007, the base pay of these NEOs was determined to be adequate by the Committee in light of the Peer Group report and subjective factors.

Annual Cash Incentive. Axcelis 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. NEOs at Axcelis participate along with all other employees in an annual cash incentive plan called the Axcelis Team Incentive plan. Annual cash incentive

compensation under the Axcelis Team Incentive plan is the result of a five step process, in which the Compensation Committee:

- (1) sets the officer's cash incentive target as a percentage of the officer's actual base earnings for the year (this is done at hire and reviewed annually);
- (2) approves, at its first meeting in each calendar year, the specific annual financial and operational goals that will drive the payout under the plan and the weighting of each goal;
- (3) determines, after the conclusion of each year, the payout under the plan by fixing the "Company Performance Score" based on goal achievement;
- (4) determines each executive officer's individual performance score to reflect the officer's performance during the course of the year; and
- (5) determines each executive officer's payout, if any, by multiplying the executive's incentive target by the executive's individual performance score and by the Company Performance Score.

As described below, because the Company's performance in 2007 was significantly below the goals established by the Committee, Axcelis paid no cash incentive bonuses to the executive officers for the year.

Each of these steps is discussed in more detail below.

Cash Incentive Targets. Cash incentive targets are fixed and adjusted based on the annual review of cash compensation at comparable companies, such as the Peer Group used in 2007, and subjective factors discussed above. Typically, the Chief Executive Officer makes recommendations to the Compensation Committee with regard to the initial and subsequent executive officer incentive targets that she believes are justified. At its meeting in August 2007, the Compensation Committee reviewed the cash incentive compensation of each incumbent executive, including the named executive officers. The Peer Group report showed that, on average, the target total cash compensation (base plus cash incentive) of the NEOs was at the 58th percentile of the target compensation in the Peer Group for comparable positions, and the average actual total cash compensation of the group was at the 57th percentile of the Peer Group comparables.

As a result of this process, none of the named executive officers had an adjustment in the officer's cash incentive target in 2007. Ms. Puma's cash incentive target was last adjusted in July 2003; the cash incentive targets for each of Mr. Bassett, Ms. Fallon and Mr. Brewer were last adjusted in June 2005; and Mr. Flynn's cash incentive target was last adjusted in August 2006. In 2007, the cash incentive targets of the NEOs were determined to be adequate by the Committee in light of the Peer Group report and subjective factors.

The current target opportunities for the NEOs under the 2007 Axcelis Team Incentive plan are fixed at percentages of base compensation ranging from 50%, in the case of Mr. Brewer, to 60%, in the cases of Mr. Flynn, Mr. Bassett and Ms. Fallon, to 100%, in the case of Ms. Puma.

Structure of the Axcelis Team Incentive Plan. The 2007 Axcelis Team Incentive plan Company Performance Score was based 60% on financial goals and 40% on non-financial operational goals. The Company Performance Score may range from 0% to 200%, based on goal achievement. A 100% Company Performance Score results in each executive having the opportunity to receive his or her target cash incentive, subject to adjustment for an individual performance score, which can range from 0% to 150%. The financial goals in the 2007 Axcelis Team Incentive plan were derived from the Company's profit plan for 2007, and included specific targets for 2007 revenues, gross margin, pre-tax profit and cash generation, all of which are important to our operating success and to increased shareholder value. Since these financial targets are set at the beginning of the year, they will vary from

publicly-announced quarterly financial guidance, as the Company's anticipated performance changes during the year. The plan also requires the Committee to consider factors relating to the quality of the financial results (such as sources of revenue, whether operational improvements impacted gross margin, and whether certain types of investment impacted earnings) as well as the actual quantitative results. The operational goals are derived from the Company's 2007 strategic plan and include multiple detailed targets in the areas of product development and customer relationships, such as goals to ship initial new products and penetrate specific numbers of new customers. Axcelis does not publicly disclose these specific financial or operational targets as this would provide competitors with information they could use to the Company's detriment. In addition, the Compensation Committee uses such a large number of targets that listing them would not provide meaningful insight into the process.

The Compensation Committee believes that achievement of each of the specific 2007 goals was challenging, but attainable. These goals were formulated in the same way as past Axcelis Team Incentive plan goals. For 2007, the financial goals reflected significant increases over 2006 financial results. Over the three years ending with 2007, the final Company Performance Scores have ranged from a low of 0% to a high of 106%, illustrating the variability of achievement of these types of goals and therefore the inherent challenge to management.

Determination of the 2007 Company Performance Score. In its meetings throughout 2007, the Compensation Committee monitored the Company's performance against the Axcelis Team Incentive goals. In January 2008, management recommended to the Committee that no 2007 Axcelis Team Incentive payout be made based on the Company's performance against the 2007 financial and operational goals. The Committee accepted this recommendation.

Determination of the 2007 Individual Performance Scores for Each Named Executive Officer. Since the Committee determined that no 2007 Axcelis Team Incentive was to be paid, it was not necessary for the Compensation Committee to determine the 2007 individual performance scores for each NEO.

Long Term Incentive Compensation through Equity. The Compensation Committee also grants the NEOs equity compensation under the 2000 Stock Plan. 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 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. In the case of the NEOs, the required ownership ranges from 20,000 shares in the case of Ms. Puma to 12,000 shares in the case of the other NEOs. These levels were set to create meaningful investments by executives 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.

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.

Form, Size and Timing of Equity Grants. 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. From the Company's initial public offering through 2004, the executive officers received annual stock option grants in the Company's annual equity program.

In 2005, the Compensation Committee determined that restricted stock units were an attractive form of equity grants in light of required equity compensation expensing under Financial Accounting Standard 123(R), which took effect January 1, 2006. Under FAS 123(R), the expense the Company records with respect to option grants can be much greater than the perceived value of those grants or the value ultimately delivered to the recipient. Providing "whole share" equity compensation allows the Committee to better align the expense to the Company of executive equity grants with the perceived value of such grants by the executive at the current time.

In the Compensation Committee's meeting in June 2005, the Committee reviewed the then current option portfolios of the executive officers and concluded that these options did not offer any substantial retention benefit or alignment with stockholders, in light of their high exercise prices. At that time, the Committee had significant concerns regarding the retention of the executive team due to recent executive departures, a recent reorganization of the Company's functions and the Company's financial condition and product alignment situation. The Committee determined, with the advice of compensation consultants, that for an equity portfolio to have a meaningful retentive effect on an executive, it should have a value of approximately three times the annual base compensation of the executive.

Based on this information, in 2005, the Committee commenced a program to reach the recommended level of equity portfolio value over the course of a three-year period using restricted stock unit grants. The Compensation Committee made an initial restricted stock unit grant to executive officers in 2005 and expressed an intention to make additional restricted stock unit grants to each of the executive officers employed in good standing with the Company in 2006 and 2007 in amounts equal to 100% of such executive's base salary in effect at the time of grant. In 2007, after reviewing the values of each executive's equity portfolio, the Committee made such additional grant of restricted stock units to each executive officer, including the NEOs, having a value at grant equal to 100% of base pay. These grants are set forth in the Grants of Plan-Based Awards in Fiscal 2007 table below. Accordingly, the decisions regarding equity compensation in 2007 were made independently of decisions on other elements of compensation.

The 2007 restricted stock unit grants to NEOs were discussed by the Compensation Committee at a regularly scheduled meeting on May 9, 2007. The Compensation Committee subsequently acted to approve the grants by a unanimous written consent effective May 18, 2007. The Committee's approval specified that the grants would become effective on July 16, 2007. It is the Committee's general practice to approve equity awards with a future effective date, typically four to eight weeks after the approval date. 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, felt 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.

Vesting Provisions. Restricted stock units granted to executives will forfeit in the event of a termination of employment prior to vesting. In setting the vesting provisions for the restricted stock unit grants to named executive officers in 2007, the Committee sought to balance the reward and retentive effect of such equity grants by setting the vest dates for $\frac{1}{3}$ of the grant on each of July 1, 2009, 2010 and 2011.

Puma Employment Agreement

In October 2007, the Compensation Committee approved an Amended and Restated Employment Agreement with Mary G. Puma. This Amended and Restated Employment Agreement (the "New Employment Agreement") became effective November 6, 2007. The New Employment Agreement reflects Ms. Puma's current compensation and position at the Company, and provides for a one year term, ending on the anniversary of the effective date. As with the prior agreement, the New Employment Agreement will automatically renew for successive one year terms if neither the Company nor Ms. Puma elects to terminate within a 60 day window period beginning 180 days prior to the next anniversary of the effective date.

With respect to separation pay, the New Employment Agreement maintained the principal terms from the prior agreement, but eliminated the Company's obligation to maintain Ms. Puma's life, disability and health coverage in certain terminations. Under the New Employment Agreement, the Company will pay up to 18 months of COBRA premiums to maintain Ms. Puma's health coverage post termination. The terms of separation pay were also modified to comply with the new regulations under Section 409A of the U.S. Income Tax Code (the "IRC") in order to avoid subjecting the potential separation pay to an immediate penalty tax as deferred compensation. This was done by (A) revising the definition of "Good Reason" (the circumstances under which Ms. Puma can voluntarily terminate employment and still receive the separation payment) to conform to the IRS's narrower "safe harbor" definition and (B) making other minor changes regarding timing of payments.

Change of Control Agreements

Part of the Company's executive compensation package is a "double-trigger" Change of Control Agreement. These agreements were entered into with each NEO on assumption of the position of an executive officer. In October, 2007 each of the Change of Control Agreements with executive officers, including the NEOs, were modified to become compliant with the new regulations under Section 409A of the IRC as described above. This was done by (A) revising the definition of "Good Reason" (the circumstances under which the executive can voluntarily terminate employment and still receive the separation payment) to conform to the IRS's narrower "safe harbor" definition and (B) making other minor changes regarding timing of payments.

These Change of Control Agreements are referred to as "double trigger" because they only provide for payment in the event of (1) a change of control of the Company that is (2) followed by or preceded by the termination of employment of the executive for reasons other than cause, death, disability or voluntary resignation without "Good Reason." The Committee believes that these Change of Control Agreements are a part of a competitive compensation package and will assist in the retention of critical talent if a possible or actual change of control should arise. It is important in a change of control to retain executive talent both to assist in the completion of the transaction and to be able to deliver all or a specified member of the management to an acquirer if that is a condition of closing. 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. The Committee believes this type of "Good Reason" termination trigger is a necessary retention device because it ensures that severance pay will be due if the executive's position after a change of control is not substantially the same as the executive's position prior to the change of control.

The Axcelis Change of Control Agreements have two material elements: (A) a lump sum cash payment equal to three years' base salary and estimated cash incentive and (B) acceleration of the unvested portion of the executive's options or restricted stock units. As shown in the table under the heading "Payments on Termination or Change in Control—Change of Control Agreements," the Company will make an additional payment to the NEOs to insulate them from the impact of excise

taxes due under Sections 280G and 4999 of the IRC. The effects of Sections 280G and 4999 generally 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 across 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 Committee believes that this practice is a necessary retention device because it is consistent with competitive pay packages and ensures the executive will receive the three years base salary and estimated cash incentive less only ordinary income taxes on that amount.

The Company believes that these particular elements will assist in retaining executive talent through a change of control event because the cash payment and the ability to access the value in otherwise unvested equity grants will insulate the executive from the hardship of the loss of the executive's job.

The Company has the right each year to terminate its obligation to make change of control payments effective on the date three years after the next anniversary date of the agreement. To do so, the Company must provide notice of non-renewal to the executive prior to such anniversary date. Additional information on these Change of Control Agreements is provided under "Payments on Termination or Change of Control" below.

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 in 2007 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 and under which the Company made a matching contribution to each participant in 2007. The matching contribution under the 401(k) Plan is the greater of (1) 100% of the employee's pre-tax contributions to the plan, capped at \$1,000, or (2) 50% of the employee's pre-tax contributions to the plan, up to the first 6% of eligible pre-tax compensation contributed to the plan. The Company's matching contributions to the accounts of the NEOs under the 401(k) plan are shown in the "All other compensation" column in the Summary Compensation Table.

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.

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 the Axcelis Team 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 would not be tax deductible to the Company. In the case of cash incentive payments, this is because certain components of the Axcelis Team Incentive plan, such as the Committee's determination that some operational and individual performance goals have been achieved, require

subjectivity that does not meet the requirements of Section 162(m). In the case of restricted stock unit awards, it is because vesting is 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 the Axcelis Team Incentive plan provides benefits to the Company that outweigh the potential tax deductions that might be available (at the levels potentially realizable under the current plan) if the plan 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. To date, the Company's tax deductions for compensation have not been limited by Section 162(m) except in connection with the Axcelis Team Incentive bonuses paid to the Chief Executive Officer with respect to 2004 and 2006. 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, the Committee considers the impact of IRC Section 409A, which imposes certain requirements on "nonqualified deferred compensation plans." As discussed above, both Ms. Puma's New Employment Agreement and the Change of Control Agreements with each of the NEOs were modified in 2007 to avoid immediate penalty taxation on potential separation payments under Section 409A.

2007 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

2007 Summary Compensation Table

Name and Principal Position	Year	Salary (\$)(1)	Stock awards (\$)(2)	Option awards (\$)(2)	Non-equity incentive plan compensation (\$)(3)	All other compensation (\$)(4)	Total (\$)(5)
Mary G. Puma <i>Chairman, Chief Executive Officer and President</i>	2007	\$ 500,000	\$ 307,455	\$ 141,446	\$ 0	\$ 12,250	\$ 961,151
	2006	\$ 500,001	\$ 197,690	\$ 249,407	\$ 556,501	\$ 6,600	\$ 1,510,199
Stephen G. Bassett <i>Executive Vice President and Chief Financial Officer</i>	2007	\$ 284,307	\$ 169,715	\$ 27,092	\$ 0	\$ 0	\$ 481,114
	2006	\$ 275,999	\$ 109,125	\$ 27,111	\$ 175,536	\$ 0	\$ 587,771
Matthew P. Flynn <i>Executive Vice President, Customer Operations</i>	2007	\$ 327,114	\$ 208,051	\$ 20,225	\$ 0	\$ 11,319	\$ 566,709
	2006	\$ 288,847	\$ 143,080	\$ 47,736	\$ 197,194	\$ 13,200	\$ 690,057
Lynnette C. Fallon <i>Executive Vice President HR/Legal and General Counsel</i>	2007	\$ 305,000	\$ 187,547	\$ 40,449	\$ 0	\$ 6,750	\$ 539,746
	2006	\$ 305,001	\$ 120,590	\$ 68,822	\$ 193,981	\$ 6,600	\$ 694,994
Kevin J. Brewer <i>Senior Vice President, Manufacturing Operations</i>	2007	\$ 258,653	\$ 184,936	\$ 18,901	\$ 0	\$ 2,326	\$ 464,816
	2006	\$ 249,999	\$ 130,074	\$ 40,259	\$ 139,125	\$ 7,160	\$ 566,617

- (1) 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.
- (2) Represents the compensation expense incurred by the Company relating to stock and option awards held by the NEO determined in accordance with FAS 123(R), using the assumptions described in Note 15 to the Company's Financial Statements included in the Form 10-K filed with the Securities and Exchange Commission for the respective year, provided that no forfeitures of awards have been assumed for the NEOs.
- (3) Non-equity incentive plan compensation represents amounts that were paid under the Axcelis Team Incentive plan, as described in the "Compensation Discussion and Analysis" above.
- (4) The amounts in this column represent (A) the amount paid in cash as a matching contribution to Axcelis' 401(k) plan in respect of contributions made by the NEO during the year, (B) amounts reimbursed under the Company's Executive Tax and Financial Planning Reimbursement Program and (C), in the case of Mr. Flynn only, amounts paid to him as a car allowance.
- (5) 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 Axcelis Team Incentive plan as described in the "Compensation Discussion and Analysis" above.

Grants of Plan Based Awards in Fiscal 2007

Name	Grant Date	Date of Compensation Committee Approval	Estimated Possible Payouts Under Non-Equity Incentive Plan Awards(1)		All Other Stock Awards: Number of Shares of Stock or Units (#)(2)	Grant Date Fair Value of Stock and Option Awards(3)
			Target (\$)	Maximum (\$)		
Mary G. Puma	7/16/2007	2/16/2007 5/18/2007	\$ 500,001	\$ 1,500,002	80,515	\$ 500,000
Stephen G. Bassett	7/16/2007	2/16/2007 5/18/2007	\$ 170,584	\$ 511,753	44,444	\$ 276,000
Matthew P. Flynn	7/16/2007	2/16/2007 5/18/2007	\$ 196,269	\$ 588,807	50,725	\$ 315,000
Lynnette C. Fallon	7/16/2007	2/16/2007 5/18/2007	\$ 183,000	\$ 549,001	49,114	\$ 305,000
Kevin J. Brewer	7/16/2007	2/16/2007 5/18/2007	\$ 129,327	\$ 387,981	40,258	\$ 250,000

- (1) Estimated Possible Payouts under Non-Equity Incentive Plan represent amounts that were targeted and possible under the 2007 Axcelis Team Incentive plan, approved by the Compensation Committee on February 16, 2007, as discussed in the "Compensation Discussion and Analysis" above. The minimum payment under this plan is \$0.00. All payouts under this plan are subject to the discretion of the Board of Directors and the executives have no contractual right to receive any payment thereunder. Actual payments under the 2007 Axcelis Team Incentive plan were determined by the Compensation Committee in 2008 and are shown under "Non-equity incentive plan compensation" in the Summary Compensation Table above.
- (2) The only equity awards issued to NEOs during 2007 were restricted stock units granted under the Company's 2000 Stock Plan granted effective July 16, 2007. One-third of these units will vest on each of July 1, 2009, July 1, 2010 and July 1, 2011, provided that vesting would be accelerated in the circumstances described under "Payments on Termination or Change in Control" below. 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 the NEO's employment terminates prior to vesting. No dividends on the shares underlying these units are paid until the shares are issued.
- (3) Represents the grant date fair value of the 2007 restricted stock units determined in accordance with FAS 123(R), using the closing price of the Company's common stock on the date of grant of \$6.21.

Outstanding Equity Awards at Fiscal 2007 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 (\$)(10)
Mary G. Puma						
	1				48,380	\$ 222,548.00
	2				83,333	\$ 383,331.80
	3				80,515	\$ 370,369.00
		606,100	0	\$ 22.00		
		84,699	0	\$ 8.44		
		177,870	0	\$ 8.43		
		100,000	0	\$ 10.28		
		100,000	0	\$ 5.85		
		125,000	0	\$ 5.70		
		125,000	0	\$ 11.48		
	4	100,000	0	\$ 11.87		
	5	75,000	25,000	\$ 7.97		
Stephen G. Bassett						
	1				26,706	\$ 122,847.60
	2				46,000	\$ 211,600.00
	3				44,444	\$ 204,442.40
		20,000	0	\$ 9.90		
	6	25,000	0	\$ 11.87		
	5	18,750	6,250	\$ 7.97		
Matthew P. Flynn						
	1				39,913	\$ 183,599.80
	2				45,833	\$ 210,831.80
	3				50,725	\$ 233,335.00
		2,329	0	\$ 8.43		
		3,388	0	\$ 8.44		
		4,500	0	\$ 22.00		
		4,911	0	\$ 14.10		
		4,910	0	\$ 13.20		
		5,000	0	\$ 10.28		
		15,500	0	\$ 6.88		
		3,750	0	\$ 5.85		
		15,000	0	\$ 5.70		
		15,000	0	\$ 11.48		
	7	15,000	0	\$ 11.87		
	5	11,250	3,750	\$ 7.97		
Lynnette C. Fallon						
	1				29,512	\$ 135,755.20
	2				50,833	\$ 233,831.80
	3				49,114	\$ 225,924.40
		27,000	0	\$ 11.75		
		13,500	0	\$ 14.10		
		13,500	0	\$ 13.20		
		30,000	0	\$ 10.28		
		30,000	0	\$ 5.85		
		30,000	0	\$ 5.70		
		30,000	0	\$ 11.48		
	8	30,000	0	\$ 11.87		
	5	22,500	7,500	\$ 7.97		

1						36,285	\$	166,911.00
2						41,667	\$	191,668.20
3						40,258	\$	185,185.19
	12,705	0	\$	8.44	1/25/2010			
	7,200	0	\$	22.00	7/10/2010			
	10,715	0	\$	14.10	7/30/2011			
	10,714	0	\$	13.20	7/30/2011			
	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			
9	15,000	0	\$	11.87	6/25/2014			
5	11,250	3,750	\$	7.97	6/25/2014			

- (1) These restricted stock units vest as to 50% of the unvested shares on each of July 1, 2008 and 2009.
- (2) These restricted stock units vest as to 50% of the shares on July 3, 2009 and 2010, provided that such vesting may accelerate, but not earlier than July 3, 2008, on achievement of market capitalization targets.
- (3) These restricted stock units vest as $\frac{1}{3}$ of the shares on each of July 1, 2009, 2010 and 2011.
- (4) Of the shares that may be acquired on exercise of these options, 25,000 may not be sold by the executive until after June 25, 2008.
- (5) The unexercisable options will become exercisable on June 25, 2008.
- (6) Of the shares that may be acquired on exercise of these options, 6,250 may not be sold by the executive until after June 25, 2008.
- (7) Of the shares that may be acquired on exercise of these options, 3,750 may not be sold by the executive until after June 25, 2008.
- (8) Of the shares that may be acquired on exercise of these options, 7,500 may not be sold by the executive until after June 25, 2008.
- (9) Of the shares that may be acquired on exercise of these options, 3,750 may not be sold by the executive until after June 25, 2008.
- (10) Using the closing market price on December 31, 2007 of \$4.60.

Option Exercises and Stock Vested During Fiscal 2007

Name	Option Awards		Stock Awards	
	Number of Shares Acquired on Exercise (#)	Value Realized on Exercise (\$)	Number of Shares Acquired on Vesting (#)(1)	Value Realized on Vesting (\$)(2)
Mary G. Puma	0	0	24,189	\$ 156,745
Stephen G. Bassett	0	0	13,352	\$ 86,521
Matthew P. Flynn	0	0	19,956	\$ 129,315
Lynnette C. Fallon	0	0	14,755	\$ 95,612
Kevin J. Brewer	0	0	18,142	\$ 117,560

- (1) Represents shares vested on July 1, 2007 on restricted stock units granted in 2005. A portion of these vested shares were withheld, and not issued, by the Company for the purposes of tax withholding. The net number of shares issued to the named executive officers were: 16,509 to Ms. Puma, 9,113 to Mr. Bassett, 13,620 to Mr. Flynn, 10,071 to Ms. Fallon and 12,382 to Mr. Brewer.
- (2) Using the closing market price on July 2, 2007 (the first trading day following the vesting date) of \$6.48.

Payments on Termination or Change in Control

Employment Agreement with Ms. Puma. In November 2007, we amended and restated our July 2000 Employment Agreement with Ms. Puma. This agreement 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. Actual incentive compensation for any year may be greater or less if actual performance is greater or less than the target. 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. See "Compensation Discussion and Analysis" above. 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 2 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 be due to Ms. Puma if a qualifying termination occurred on December 31, 2007:

Lump sum cash payment(1)	Value of accelerated vesting on equity awards(2)	18 months of COBRA premiums for health coverage(3)	Total
\$2,113,000	\$ 976,249	\$ 21,816	\$ 3,111,065

- (1) This represents 24 months of Ms. Puma's base salary at December 31, 2007 plus two times an annual bonus amount. The annual bonus amount is a percentage of her current base salary equaling the percentage of her base salary paid to her as a bonus in respect of the 2006 fiscal year. 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 2007 (\$4.60). 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 COBRA premiums in effect during 2008 for Ms. Puma's coverage elections. Actual COBRA rates will increase on January 1, 2009.

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 the chart below.

The amounts due to each named executive officer in the event that a change of control and termination occurred on December 31, 2007 are set forth in the table below:

Estimated Payments under the Change of Control Agreements if due at December 31, 2007

Name	Lump sum cash payment(1)	Value of accelerated vesting on equity awards(2)	Excise tax due under IRC 280G, plus gross-up amount(3)	Total
Mary G. Puma	\$ 3,640,000	\$ 976,249	\$ 1,718,391	\$ 6,334,640
Stephen G. Bassett	\$ 1,620,000	\$ 538,890	\$ 788,228	\$ 2,947,118
Matthew P. Flynn	\$ 2,020,200	\$ 627,767	\$ 1,038,241	\$ 3,686,208
Lynnette C. Fallon	\$ 1,665,300	\$ 595,511	\$ 833,269	\$ 3,094,080
Kevin J. Brewer	\$ 1,413,500	\$ 543,766	\$ 725,653	\$ 2,682,919

- (1) This amount, which represents three times the NEO's current base salary plus an estimated bonus amount, is due within 30 days of termination.
- (2) 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 2007 (\$4.60). 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.
- (3) As discussed in the "Compensation Discussion and Analysis," 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 I.R.C. 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 determine recommended 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.

2007 Director Fees. After reviewing a peer benchmarking report prepared by a compensation consultant in February 2007, the Board of Directors, at the recommendation of the Nominating and Governance Committee, approved changes to the compensation for independent directors. They approved the following cash fees, effective January 1, 2007:

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 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.

2007 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. No new non-employee directors joined the Board in 2007.

Also, in February 2007, based on the peer group study, the Nominating and Governance Committee recommended to the Compensation Committee the issuance under the 2000 Stock Plan of shares of restricted stock to each of the non-employee directors elected in years prior to 2007, having a value at grant equal to \$100,000. On May 9, 2007, the Compensation Committee approved such grants, effective July 16, 2007. These restricted stock grants became fully vested on the 181st day after the date of grant if the 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, which provide that non-employee directors should own a minimum of 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.

The chart below shows compensation expense for all directors who served the Company during 2007:

Name	Fees earned or paid in cash (\$)	Stock awards (\$)(1)(2)	Option awards (\$)(1)(3)	Total (\$)
R. John Fletcher	\$ 59,000	\$ 92,171	\$ —	\$ 151,171
Stephen R. Hardis	\$ 72,000	\$ 92,171	\$ —	\$ 164,171
William C. Jennings	\$ 68,125	\$ 92,171	\$ —	\$ 160,296
Michio Naruto(4)	\$ 39,000	\$ 820	\$ —	\$ 39,820
Patrick H. Nettles	\$ 54,500	\$ 92,171	\$ —	\$ 146,671
H. Brian Thompson	\$ 56,375	\$ 92,171	\$ —	\$ 148,546
Geoffrey Wild	\$ 55,000	\$ 91,351	\$ 94,215	\$ 240,566

- (1) Represents the compensation expense incurred by the Company relating to stock and option awards held by the Director during 2007 determined in accordance with FAS 123(R), using the assumptions described in Note 15 to the Company's Financial Statements included in the 2007 10-K, provided that no forfeitures of awards have been assumed.
- (2) On July 16, 2007, each of the outside directors received a restricted stock grant for 16,103 shares of Axcelis common stock, vesting on January 16, 2008. The grant date fair value of this equity award was \$100,000. As of December 31, 2007, each of Messrs. Hardis, Fletcher, Thompson, Jennings and Nettles held an aggregate of 31,693 shares of common stock received as restricted stock grants from the Company. Mr. Wild holds 16,103 shares of common stock received as a restricted stock grant from the Company.
- (3) As of December 31, 2007, the non-employee directors in office held the following total stock options, all of which were fully vested and had exercise prices ranging from \$6.03 to \$16.63:

	Aggregate # of shares subject to outstanding options	Lowest exercise price	Highest exercise price
Fletcher	55,000	\$ 8.75	\$ 11.91
Hardis	100,000	\$ 6.08	\$ 16.63
Jennings	55,000	\$ 6.03	\$ 11.91
Naruto(4)	40,000	\$ 6.09	\$ 6.09
Nettles	85,000	\$ 6.08	\$ 14.17
Thompson	85,000	\$ 6.08	\$ 13.22
Wild	40,000	\$ 6.61	\$ 6.61

- (4) Mr. Naruto resigned during 2007.

CORPORATE GOVERNANCE

Board of Directors Independence and Meetings

The Board of Directors has determined that all directors who served on the Board during 2007, 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 2007, 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 determined that this relationship did not impair Mr. Hardis' independence.

Our Board of Directors held ten meetings during 2007 and acted twice by unanimous written consent. The average rate of attendance at Board and committee meetings for all current directors was 99%. 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 current Board members then in office attended the annual meeting in 2007. Our Board has standing Audit, Compensation and Nominating and Governance Committees. Independent directors have regularly scheduled executive sessions at which only independent directors are present.

Compensation Committee

During 2007, 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 2007, the Compensation Committee met five times and acted twice by unanimous written consent. 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. The Compensation Committee usually makes annual equity grants in its second meeting in each year (which typically occurs in May or June), selecting a future date for the effectiveness of the annual equity grants, which is usually four to six weeks after the meeting date. Other compensation decisions are made throughout the year, as circumstances warrant and as described in detail in "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 2007, the Compensation Committee's compensation consultant was Pearl Meyer & Partners. 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. Bassett 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 2007, see the "Compensation Discussion and Analysis" above.

Nominating and Governance Committee

During 2007, the Nominating and Governance Committee was composed of Mr. Nettles (Chairman) and Mr. Hardis. 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 five meetings in 2007.

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 Policy.

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. 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 12 times during 2007. The Audit Committee consisted of Mr. Jennings (Chairman), and Messrs. Fletcher and Wild.

The Board of Directors has determined that each of Mr. Jennings, Mr. Fletcher and Mr. Wild are audit committee financial experts as defined in Item 401 of Regulation S-K promulgated 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 2007, see the "2007 Audit Committee Report" below.

2007 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 May, July and October of 2007, prior to the release of the financial results for the first, second and third quarters of 2007, respectively and in January 2008 prior to the release of our 2007 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, the scope and results of the Company's internal audit plans, changes to the Audit Committee charter and other matters. In addition, throughout 2007, the Audit Committee provided oversight of the Company's preparations for management's assessment of its internal controls over financial reporting as required by Section 404 of the Sarbanes Oxley Act of 2002. The Committee receives regular reports from management on this topic and confirmation of the processes and timing of preparation from the independent auditors.

At all of these meetings, Axcelis' Chief Executive Officer and Chief Financial Officer were present, as was 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, the Company's internal 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 2007. At the 2007 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, 2007 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 received from the independent auditors (1) their annual written reports covering matters required to be discussed by the auditors with the Committee under Statement on Auditing Standards No. 61, *Communication with Audit Committees* and (2) their disclosures and the letter regarding independence from the Company and its management, which disclosures and letter are made under Independence Standards Board Standard No. 1, *Independence Discussions with Audit Committees*. Both 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 2007 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 2: 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
Geoffrey Wild

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 the NASDAQ Global Market 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 2007, 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 2007, 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 2007 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 2007, our directors, officers, and 10% stockholders complied with all Section 16(a) filing requirements, except that Form 4s due by Mary G. Puma, Stephen G. Bassett, Matthew P. Flynn, Lynnette C. Fallon, Kevin J. Brewer, Craig Halterman, Marc S. Levine, Mark J. Namaroff and Donald W. Palette in July 2007, regarding the surrender of shares for tax withholding on vesting of restricted stock units, were not filed until December 14, 2007, and Sterling Capital Management LLC failed to file a Form 3 reporting its acquisition of beneficial ownership of more than 10% of our common stock prior to November 29, 2007.

Deadlines for Stockholder Proposals

Assuming the 2009 annual meeting is not more than 30 days before or 30 days after May 1, 2009, if you wish to bring business before or propose director nominations at the 2009 annual meeting, you must give written notice to Axcelis by January 31, 2009 (the date 90 days before the anniversary of the 2008 annual meeting).

If you intend to bring proposed business to the 2009 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 December 2, 2008 (120 days before the anniversary date of the mailing of this proxy statement), assuming the 2009 annual meeting is not more than 30 days before or 30 days after May 1, 2009.

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.

**ARTICLE 6 OF THE PROPOSED AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION OF AXCELIS TECHNOLOGIES, INC.**

In the proposed Amended and Restated Certificate of Incorporation, Article 6 will be amended and restated to read in its entirety as follows:

6. *Board of Directors.*

6.1 *Number of Directors.* The number of members of the Board of Directors will be fixed from time to time by resolution adopted by the affirmative vote of a majority of the entire Board of Directors but (subject to vacancies) in no event may there be fewer than three directors nor more than 15 directors.

6.2 *Election.* At each annual meeting of shareholders beginning with the 2009 annual meeting of shareholders, all directors whose terms end at such annual meeting shall be elected for terms expiring at the next annual meeting of shareholders. Accordingly, the respective terms of all directors in office on the effective date of this Amended and Restated Certificate of Incorporation shall not be shortened as a result of the foregoing sentence. All directors shall serve until their respective successors shall be elected and qualified, subject to prior death, resignation, retirement or removal. In no event will a decrease in the number of directors shorten the term of any incumbent director. Notwithstanding the foregoing, and except as otherwise required by law, whenever the holders of any one or more series of Preferred Stock shall have the right, voting separately as a class, to elect one or more directors of the Corporation, the election, terms of office and other features of such directorships shall be governed by the terms of the vote establishing such series.

6.3 *Vacancies.* Except as otherwise determined by the Board of Directors in establishing a series of Preferred Stock as to directors elected by holders of such series, any vacancy in the Board of Directors, including a vacancy resulting from the enlargement of the Board of Directors, shall be filled by the directors then in office, though less than a quorum. A director who is elected to fill a vacancy shall be elected for a term expiring at the next annual meeting of shareholders.

6.4 *Removal.* Except as otherwise determined by the Board of Directors in establishing a series of Preferred Stock as to directors elected by holders of such series, at any special meeting of the shareholders called at least in part for the purpose, any director or directors may be removed from office only (a) for cause by the affirmative vote of at least a majority of the voting power of all of the then outstanding shares of stock entitled to vote generally in the election of directors or (b) with respect to directors elected at or after the 2009 annual meeting of shareholders, without cause by the affirmative vote of the holders of at least seventy-five percent (75%) of the voting power of all of the then outstanding shares of stock entitled to vote generally in the election of directors. The provisions of this subsection shall be the exclusive method for the removal of directors.



Using a **black ink** pen, mark your votes with an X as shown in this example. Please do not write outside the designated areas.



Annual Meeting Proxy Card

PLEASE FOLD ALONG THE PERFORATION, DETACH AND RETURN THE BOTTOM PORTION IN THE ENCLOSED ENVELOPE.

A Proposals — **The Board of Directors recommends a vote FOR all the listed nominees and FOR Proposal 2. The Board of Directors has made no recommendation regarding Proposal 3.**

- | | | | | | | |
|----|--------------------------------------------------------------|----------|---------------|--------------|--|--|
| 1. | Election of Directors:
01 - R. John Fletcher | For
○ | Withhold
○ | | | |
| | 02 - Stephen R. Hardis | For
○ | Withhold
○ | | | |
| | 03 - H. Brian Thompson | For
○ | Withhold
○ | | | |
| 2. | Ratification of appointment of independent auditors. | For
○ | Against
○ | Abstain
○ | | |
| 3. | Proposal to amend the Restated Certificate of Incorporation. | For
○ | Against
○ | Abstain
○ | | |

B Non-Voting Items

Change of Address — Please print new address below.

Comments — Please print your comments below.

C Authorized Signatures — This section must be completed for your vote to be counted. — Date and Sign Below

Please sign exactly as name(s) appears hereon. Joint owners should each sign. When signing as attorney, executor, administrator, corporate officer, trustee, guardian, or custodian, please give full title.

Date (mm/dd/yyyy) — Please print date below.

/ /

Signature 1 — Please keep signature within the box.

Signature 2 — Please keep signature below. within the box.

THIS IS YOUR PROXY. YOUR VOTE IS IMPORTANT.

DO YOU NEED ASSISTANCE IN ANY OF THE FOLLOWING AREAS?

• ADDRESS CHANGES - LEGAL TRANSFERS

• CONSOLIDATION OF ACCOUNTS — ELIMINATE MULTIPLE ACCOUNTS FOR ONE HOLDER AND CERTAIN DUPLICATE SHAREHOLDER MAILINGS GOING TO ONE ADDRESS.

JUST CALL OUR TRANSFER AGENT'S TELEPHONE RESPONSE CENTER:

(781) 575-2725

OR WRITE TO:

COMPUTERSHARE TRUST CO., N.A.

P.O. BOX 43078

PROVIDENCE, RI 02940-3078

PLEASE FOLD ALONG THE PERFORATION, DETACH AND RETURN THE BOTTOM PORTION IN THE ENCLOSED ENVELOPE.

The logo for Axcelis Technologies, Inc. features the word "axcelis" in a bold, lowercase, sans-serif font. The letters are black and have a slight shadow effect, giving them a three-dimensional appearance. The logo is positioned on the left side of the page, above a horizontal line.

Proxy — Axcelis Technologies, Inc.

**Proxy Solicited on Behalf of the Board of Directors
for Annual Meeting on May 1, 2008.**

The undersigned hereby appoints Mary G. Puma, Stephen G. Bassett or Lynnette C. Fallon, or any of them, and any substitutes, to be the attorneys and proxies of the undersigned at the Annual Meeting of Stockholders of Axcelis Technologies, Inc. ("Axcelis") to be held at 11:00 a.m. EST on Thursday May 1, 2008 at the offices of Axcelis at 108 Cherry Hill Drive, Beverly, Massachusetts, or at any adjournment thereof, and to vote at such meeting the shares of common stock of Axcelis the undersigned held of record on the books of Axcelis on the record date for the meeting for the election of the nominees listed on the reverse side, on the ratification of Axcelis' independent auditors and the proposal to amend Axcelis' Restated Certificate of Incorporation, as described in the Proxy Statement, and on any other business before the meeting, with all powers the undersigned would possess if personally present.

You are encouraged to specify your choices by marking the appropriate boxes, SEE REVERSE SIDE, but you need not mark any boxes if you wish to vote in accordance with the Board of Directors' recommendations. The proxies cannot vote your shares unless you sign and return this card.

PLEASE VOTE, DATE AND SIGN THIS PROXY ON THE OTHER SIDE AND RETURN PROMPTLY IN THE ENCLOSED ENVELOPE.
