

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

**SCHEDULE 14A**  
**(Rule 14a-101)**  
**INFORMATION REQUIRED IN PROXY STATEMENT**

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:  
\_\_\_\_\_
- (2) Aggregate number of securities to which transaction applies:  
\_\_\_\_\_
- (3) Per unit price or other underlying value of transaction computed pursuant to Exchange Act Rule 0-11 (set forth the amount on which the filing fee is calculated and state how it was determined):  
\_\_\_\_\_
- (4) Proposed maximum aggregate value of transaction:  
\_\_\_\_\_
- (5) Total fee paid:  
\_\_\_\_\_
- Fee paid previously with preliminary materials.  
 Check box if any part of the fee is offset as provided by Exchange Act Rule 0-11(a)(2) and identify the filing for which the offsetting fee was paid previously. Identify the previous filing by registration statement number, or the Form or Schedule and the date of its filing.
- (1) Amount Previously Paid:  
\_\_\_\_\_
- (2) Form, Schedule or Registration Statement No.:  
\_\_\_\_\_
- (3) Filing Party:  
\_\_\_\_\_
- (4) Date Filed:  
\_\_\_\_\_

**SUPPLEMENT TO PROXY STATEMENT**  
**FOR THE ANNUAL MEETING OF STOCKHOLDERS OF**  
**AXCELIS TECHNOLOGIES, INC.**  
**TO BE HELD ON MAY 2, 2012**

On or about March 26, 2012, Axcelis Technologies, Inc. (the "Company") made available a proxy statement (the "Proxy Statement") to its stockholders in connection with its 2012 Annual Meeting of Stockholders (the "Annual Meeting"). The Annual Meeting will be held at the offices of the Company at 108 Cherry Hill Drive, Beverly, Massachusetts, at 11:00 a.m. EST on Wednesday, May 2, 2012. The Company's Board of Directors has fixed the close of business on March 5, 2012 as the record date for determination of the stockholders entitled to vote at the Annual Meeting or any adjournment thereof. This Proxy Statement Supplement (the "Supplement") amends and supplements the Proxy Statement.

Proposal 2 in the Proxy Statement requests that the Company's stockholders approve the Company's 2012 Equity Incentive Plan. On April 17, 2012, the Company's Board of Directors amended the 2012 Equity Incentive Plan to reduce the number of shares of stock available for issuance from 6,000,000 shares to 3,800,000 shares, subject to adjustment as described in the Proxy Statement. Specifically, the first sentence of Section 4(a) of the Equity Incentive Plan has been amended to read as follows:

“Subject to adjustment under subsection 4(b), up to an aggregate of 3,800,000 shares of Common Stock may be issued pursuant to Awards, including Incentive Stock Options, under the Plan.”

The decrease in the number of shares of common stock authorized for awards under the 2012 Equity Incentive Plan will reduce the potential dilutive impact of the 2012 Equity Incentive Plan on the Company’s stockholders, as compared to the original proposal. Except as described above, the 2012 Equity Incentive Plan and the description thereof contained in the Proxy Statement remain unchanged. **The Board of Directors continues to recommend unanimously that the stockholders vote FOR the proposals listed in the Proxy Statement, as supplemented.**

#### **Voting Procedures**

You do not have to take any action if you have previously voted your shares on the Annual Meeting proposals and do not wish to change your vote on any proposal. If you are a registered holder and have already voted your shares on the Annual Meeting proposals and wish to change your vote on any proposal, you may revoke your proxy before it is voted at the Annual Meeting by (i) using the Internet ([www.investorvote.com/acls](http://www.investorvote.com/acls)) (ii) calling the toll-free number 1-800-652-VOTE(8683), (iii) filing with our Corporate Secretary, Lynnette C. Fallon, a written revocation or a duly executed proxy card bearing a later date or (iv) attending the Annual Meeting and voting in person. Authorizations submitted over the Internet or by telephone must be received by 1:00 a.m., Eastern Time, on May 2, 2012.

If the shares you own are held in “street name” by a bank or brokerage firm and you wish to change your vote on any proposal, please follow the voting instruction form provided to you by such bank or brokerage firm. If your shares are held in a brokerage account, you must make arrangements with your broker or bank to revoke your proxy.

If you have not already voted your shares on the Annual Meeting proposals, you are urged to vote using one of the methods described in the Proxy Statement as soon as possible, even if you plan to attend the Annual Meeting. Voting in advance will not prevent you from voting in person if you attend the Annual Meeting, but will ensure that your vote is counted if you are unable to attend the Annual Meeting. The information contained in this Supplement should be read in conjunction with the Proxy Statement. There is no

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change in the time or place of the Annual Meeting or the record date to determine stockholders entitled to notice of and to vote at the Annual Meeting.

April 17, 2012  
By Order of the Board of Directors  
Lynnette C. Fallon, *Secretary*

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