

Prospectus Supplement No. 2
(To Prospectus dated September 12, 2007)

ELECTRO-OPTICAL SCIENCES, INC.
2,500,219 Shares
Common Stock

This prospectus supplement relates to the resale from time to time by selling stockholders of 2,500,219 shares of our common stock.

This prospectus supplement, which supplements the prospectus dated September 12, 2007, contains information about certain selling stockholders.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

November 5, 2009

SELLING STOCKHOLDERS

The shares of common stock being offered by the selling stockholders are those previously issued to the selling stockholders and those issuable to the selling stockholders upon exercise of the warrants. We are registering the shares of common stock in order to permit the selling stockholders to offer the shares for resale from time to time. Except for the ownership of the shares of common stock and the warrants, and except for Mr. Lufkin who serves on our Board of Directors, the selling stockholders have not had any material relationship with us within the past three years.

The table below lists the selling stockholders and other information regarding the beneficial ownership of the shares of common stock by each of the selling stockholders. We prepared the table below based on the information supplied to us by the selling stockholders named in the table. The selling stockholders may, however, have sold, transferred or otherwise disposed of all or a portion of their securities since the date on which they provided such information.

In accordance with the terms of registration rights agreement with the holders of the shares of common stock and the warrants, this prospectus generally covers the resale of that number of shares of common stock equal to the number of shares of common stock issued and the shares of common stock issuable upon exercise of the related warrants, determined as if the outstanding warrants were exercised, as applicable, in full, in each case, as of the trading day immediately preceding the date this registration statement was initially filed with the SEC.

Under the terms of the warrants, a selling shareholder may not exercise the warrants, to the extent such exercise would cause such selling shareholder, together with its affiliates, to beneficially own a number of shares of common stock which would exceed 4.99% of our then outstanding shares of common stock following such exercise, excluding for purposes of such determination shares of common stock issuable upon exercise of the warrants which have not been exercised. The number of shares in the fourth column does not reflect this limitation. The selling stockholders may sell all, some or none of their shares in this offering. See "Plan of Distribution."

| | Name of Selling Stockholder | Number of Shares Owned Prior to Offering¹ | Maximum Number of Common Shares to be Sold Pursuant to this Prospectus | Maximum Number of Common Shares, Issuable Upon Exercise of Warrants, to be Sold Pursuant to this Prospectus | Number of Shares Owned After Offering | Percentage of Class Owned After Offering |
|------|---|---|---|--|--|---|
| (1) | Fidelity Advisor Series VII: Fidelity Advisor Health Care Fund ² | 1,440,537 | 66,000 | 16,500 | 1,440,537 | 9.4% |
| (2) | Fidelity Select Portfolios: Medical Equipment and Systems ² | 1,440,537 | 201,800 | 50,450 | 1,440,537 | 9.4% |
| (3) | Fidelity Health Care Central Investment Portfolio ² | 1,440,537 | 74,600 | 18,650 | 1,440,537 | 9.4% |
| (4) | Variable Insurance Products Fund IV: Health Care Portfolio ² | 1,440,537 | 7,600 | 1,900 | 1,440,537 | 9.4% |
| (5) | John Hancock Funds II Emerging Growth Fund ³ | 35,972 | 182,613 | 45,653 | 35,972 | * |
| (6) | John Hancock Trust Emerging Growth Trust ³ | 5,736 | 26,087 | 6,521 | 5,736 | * |
| (7) | DD Growth Premium ⁴ | 0 | 150,000 | 37,500 | 0 | — |
| (8) | Enable Growth Partners LP ⁵ | 0 | 105,543 | 26,385 | 0 | — |
| (9) | Pierce Diversified Strategy Master Fund LLC, Ena ⁵ | 0 | 7,500 | 1,875 | 0 | — |
| (10) | Truk Opportunity Fund, LLC by: Atoll Asset Management, LLC ⁶ | 0 | 78,671 | 19,667 | 0 | — |
| (11) | Truk International Fund, LP by: Atoll Asset Management, LLC ⁷ | 0 | 12,807 | 3,201 | 0 | — |
| (12) | LNW Family, L.P. ⁸ | 0 | 86,957 | 0 | 0 | — |

| | <u>Name of Selling Stockholder</u> | <u>Number of Shares Owned Prior to Offering¹</u> | <u>Maximum Number of Common Shares to be Sold Pursuant to this Prospectus</u> | <u>Maximum Number of Common Shares, Issuable Upon Exercise of Warrants, to be Sold Pursuant to this Prospectus</u> | <u>Number of Shares Owned After Offering</u> | <u>Percentage of Class Owned After Offering</u> |
|------|--|---|---|--|--|---|
| (13) | Bonanza Master Fund, Ltd. ⁹ | 506,700 | 1,000,000 | 0 | 506,700 | 3.3% |
| (14) | OTA LLC ¹⁰ | 81,250 | 0 | 271,739 | 81,250 | * |

* Less than 1.0%

1 Beneficial ownership is determined in accordance with the rules of the SEC. Percentages are based on 15,401,882 shares of common stock that were outstanding as of August 6, 2007.

2 The entity is a registered investment fund (the "Fund") advised by Fidelity Management & Research Company ("FMR Co."), a registered investment advisor under the Investment Advisers Act of 1940, as amended. FMR Co., 82 Devonshire Street, Boston, Massachusetts 02109, a wholly-owned subsidiary of FMR Corp. and an investment adviser registered under Section 203 of the Investment Advisers Act of 1940, is the beneficial owner of the 1,878,037 shares of common stock outstanding of the Company as a result of acting as investment adviser to various investment companies registered under Section 8 of the Investment Company Act of 1940. Edward C. Johnson 3d, FMR Corp., through its control of FMR Co., and the Fund each has sole power to dispose of the securities owned by the Fund. Neither FMR Corp. nor Edward C. Johnson 3d, Chairman of FMR Corp., has the sole power to vote or direct the voting of the shares owned directly by the Fund, which power resides with the Fund's Board of Trustees. The Fund is an affiliate of a broker-dealer. The Fund purchased the securities in the ordinary course of business and, at the time of the purchase of the securities to be resold, the Fund did not have any agreements or understandings, directly or indirectly, with any person to distribute the securities.

3 Ismail Gunes of MF Global Investment Management U.S., LLC has voting and investment power of the shares that this selling stockholder owns. This selling stockholder is an affiliate of a broker-dealer. This selling stockholder purchased the securities in the ordinary course of business and, at the time of purchase of the securities to be resold, this selling stockholder had no agreements or understandings, directly or indirectly, with any person to distribute the securities.

4 Enrico Danielelso directly or indirectly alone or with others has power to vote or dispose of the securities owned by this selling stockholder.

5 Mitch Levine directly or indirectly alone or with others has power to vote or dispose of the securities owned by this selling stockholder.

6 Michael E. Fein and Stephen E. Saltzstein, as principals of Atoll Asset Management, LLC, the Managing Member of Truk Opportunity Fund, LLC, exercise investment and voting control over the securities owned by Truk Opportunity Fund, LLC. Both Mr. Fein and Mr. Saltzstein disclaim beneficial ownership of the securities owned by Truk Opportunity Fund, LLC.

7 Michael E. Fein and Stephen E. Saltzstein, as principals of Atoll Asset Management, LLC, the Managing Member of Truk International Fund, LP, exercise investment and voting control over the securities owned by Truk International Fund, LP. Both Mr. Fein and Mr. Saltzstein disclaim beneficial ownership of the securities owned by Truk International Fund, LP.

8 Nancy Wilemon Smith directly or indirectly alone or with others has power to vote or dispose of the securities owned by this selling stockholder.

9 Bernay Box directly or indirectly alone or with others has power to vote or dispose of the securities owned by this selling stockholder.

10 Ira M. Leventhal, Senior Managing Director of this selling stockholder, directly or indirectly alone or with others has power to vote or dispose of the securities owned by this selling stockholder. OTA LLC is a registered broker-dealer.