BIOGRAPHICAL DATA

NAME: Eli Yablonovitch DATE OF BIRTH: December 15, 1946

ACADEMIC DEGREES:

Ph. d.	Harvard University, Cambridge, Massachusetts	1972
A. M.	Harvard University, Cambridge, Massachusetts	1969
B. Sc.	McGill University, Montreal, Canada	1967

POSITIONS HELD:

University of California, Berkeley, The James & Katherine Lau Engineering Chair
Professor of Electrical Engineering & Computer Sciences, 2007-present
Senior Faculty Scientist, Lawrence Berkeley National Laboratory, 2007-present
Member, Kavli Energy Nano-Sciences Institute at Berkeley
Director of the NSF Center for Energy Efficient Electronics Science (E^3S), 2010-present

University of California, Los Angeles, The Northrop-Grumman Optoelectronics Chair
Professor of Electrical Engineering, 1993-2007.

Bell Communications Research, 1984-1993
Director, Solid-State Physics Research, 1991-1993
Distinguished Member of Staff, 1990-1993

Exxon Research Center, 1979-1984
Research Associate and Head of Optical Sciences Group

Harvard University
Associate Professor of Applied Physics, 1976-1979
Assistant Professor of Applied Physics, 1974-1976.

Bell Telephone Laboratories, Member of Technical Staff, 1972-1974.

Teaching Fellow, Harvard University, 1971,1972.

ADDITIONAL POSTS:

Technion, Haifa, Israel, Distinguished Visiting Professor, 2012-present

Hong Kong University of Science & Technology,
Visiting Professor, Institute for Advanced Study, 2010-present

Adjunct Professor of Electrical Engineering, UCLA, 2007-present

HONORS:

Rank Prize (UK), 2014, for "the idea that strained semiconductor lasers would have superior performance due to reduced valence band (hole) effective mass. Almost all semiconductor lasers use this concept, including for DVD players, red laser pointers, and internet telecommunications. Nearly every click on the internet uses this idea.

Elected as Foreign Member of the Royal Society of London, 2013
Elected to the American Academy of Arts and Sciences, 2012
Elected to the National Academy of Sciences, 2003
Elected to the National Academy of Engineering, 2003.

Harvey Prize of Israel, 2012, for "pioneering discoveries in photonics, optoelectronics, and semiconductors, that impacted our lives".

IEEE Photonics Award, 2012, for "pioneering contributions to photonic crystals, the photonic bandgap, and photonic bandgap engineering".

Mountbatten Medal of the British IET, 2010, for "outstanding contributions to electronics".

Julius Springer Prize in Applied Physics, 2001, "for the impact of photonic crystals on basic research, as well as on a great variety of applications".

R. W. Wood Prize of the Optical Society of America, 1996, "for proposing the concept of Photonic Crystals and electromagnetic band structure engineering".

The W. Streifer Scientific Achievement Award of the IEEE/LEOS, 1993 "for contributions to opto-electronics, including the physics of strained-layer lasers and photonic applications of low dimensional structures".

Alfred P. Sloan Fellow, 1978-79.

The Adolf Lomb Medal of the Optical Society of America, 1978.

Fellow of the Institute of Electrical & Electronics Engineers, 1992,
Fellow of the American Physical Society, 1990,
Fellow of the Optical Society of America, 1982.

HONORARY DOCTORATES:

Ph. d. (Honorary)	Hong Kong University of Science & Technology	2011
Ph. d. (Honorary)	KTH, Royal Inst. of Tech., Stockholm, Sweden	2004

SPECIAL HONORS:

Yablonovitch's paper: "Inhibited Spontaneous Emission in Solid-State Physics and Electronics," Phys. Rev. Lett., Vol. 58, 2059 (1987), has over 9000 citations.
It has the 2nd highest citation count of any paper ever published in Physical Review Letters.

NAMED LECTURESHIPS:

A.W. Scott Lecturer, University of Cambridge, United Kingdom	May 13-17, 2013
Vincent Meyer Colloquium, Technion, Haifa, Israel	Mar. 26-29, 2012
Cave Memorial Lecture, Queens University, Kingston, Ontario, Canada	Mar. 24, 2011
Edison Lecture, Naval Research Laboratory	Dec. 7, 2010
Herman Haus Lecture, Massachusetts Institute of Technology	April 18, 2007
Walter Schottky Lecture, Aachen University, Germany	July 11, 2006
Morris Loeb Lecturer, Harvard University	April 5-9, 2005
Anson L. Clark Memorial Lecture at Univ. of Texas, Dallas	April 5-6, 2004
Edison Lecture, Notre-Dame University	Mar. 17, 2004
Moore Distinguished Scholar, California Institute of Technology	Sept. 2003-Jun. 2004
Clifford Paterson Lecturer of the Royal Society (London)	May 15-19, 2000

ENTREPRENEURIAL ACTIVITIES:

Co-Founder & Board Member of Ethertronics, Inc. San Diego, CA, antennas for portable electronics: http://www.ethertronics.com/ 2000-present

Co-Founder & Board Member of Luxtera, Inc. Carlsbad, CA, nano-photonic integration in foundry Silicon: http://www.luxtera.com/ 2001-present

Co-Founder of Luminescent, Inc. Palo Alto, CA, a photolithography software company: http://www.luminescent.com/ 2002-2012, acquired by Synopsys Inc.

Co-Founder & Board Member of Alta Devices, Inc. Santa Clara, CA, thin film GaAs solar cells: http://www.altadevices.com/ 2008-2014, acquired by Hanergy Inc.

Research Highlights of Yablonovitch's career:

In his photovoltaic research, Yablonovitch introduced the $4n^2$ light-trapping factor that is in worldwide use, for almost all commercial solar panels. This factor increased the theoretical limits and practical efficiency of solar cells. $4n^2$ is based on statistical mechanics, and is sometimes called the "*Yablonovitch Limit*".

Yablonovitch introduced the idea that strained semiconductor lasers could have superior performance due to reduced valence band (hole) effective mass. Today, almost all semiconductor lasers use this concept, including for optical telecommunications, in most mouse-clicks, for DVD players, and in the ubiquitous red laser pointers.

Yablonovitch is regarded as a Father of the Photonic Bandgap concept, and coined the term "Photonic Crystal". The geometrical structure of the first experimentally realized Photonic bandgap, is sometimes called "*Yablonovite*".

PATENTS:

1. “Shielded Spiral Sheet Antenna Structure and Method”, (with L. Declos and S. Rowson), U. S. Patent No. 6,677,915 (January 13, 2004).
2. “Magnetic Dipole Antenna Structure and Method”, (with L. Declos and S. Rowson), U. S. Patent No. 6,567,053 (May 20, 2003).
3. “Circuit and Method for Eliminating Surface Currents on Metals”, (with D. Sievenpiper), U. S. Patent No. 6,262,495 (July 17, 2001).
4. “Patterning Method for Epitaxial Lift-off Processing,” (with T. J. Gmitter) U. S. Patent No. 5,201,996 (Apr. 13, 1993).
5. “Optical Reflector Structure, Device, Method of Fabrication, and Communications Method,” U. S. Patent No. 5,172,267 (Dec. 15, 1992).
6. “Arsenic Sulfide Surface Passivation of III-V Semiconductors,” (with B. G. Bagley and T. J. Gmitter) U. S. Patent No. 4,920,078 (Apr. 27, 1990).
7. “Passivation of Indium Gallium Arsenide Surfaces,” (with T. J. Gmitter), U. S. Patent No. 4,843,037 (June 27, 1989).
8. “Method of Making a DH Laser With Strained Layers by MBE,” U. S. Patent No. 4,804,639 (Feb. 14, 1989).
9. “Method for Lifting-Off Epitaxial Films” (with T. J. Gmitter), U. S. Patent No. 4,846,931 (July 11, 1989).
10. “Lift-off and Subsequent Bonding of Epitaxial Films,” (with T. J. Gmitter) U. S. Patent No. 4,883,561 (Nov. 28, 1989).
11. “Passivation of Gallium Arsenide Surfaces,” (with T. J. Gmitter and C. J. Sandroff), U. S. Patent No. 4,751,200 (June 14, 1988).
12. “Method for Producing an Electronically Passivated Surface on Crystalline Silicon Using a Fluorination Treatment and an Organic Overlayer, Using Hydrogen Fluoride,” (with H. W. Deckman and B. R. Weinberger), U. S. Patent No. 4,608,097 (Aug. 26, 1986).
13. “Method for Making Optically Enhanced Thin Film Photovoltaic Device Using Lithographically Defined Random Surfaces,” (with H. W. Deckman, H. Witzke, and C. Wronski), U. S. Patent No. 4,554,727 (Nov. 26, 1985).
14. “Inverted Optically Enhanced Solar Cell,” U. S. Patent No. 4,525,593 (June 25, 1985).
15. “Short Laser Pulse Generation by Gas Breakdown Switching and Highly Selective Spectral Filtering,” (with J. Goldhar), U. S. Patent No. 3,979,694 (Sept. 7, 1976).

PUBLICATIONS:

1. Yablonovitch, E., Bloembergen, N., Wynne, J.J. "Dispersion of the Nonlinear Optical Susceptibility in n-InSb," Phys. Rev. B, Vol. 3(6), pp. 2060-2062, March 1971.
2. Yablonovitch, E. "Optical Dielectric Strength of Alkali-Halide Crystals Obtained by Laser-Induced Breakdown," Appl. Phys. Lett., Vol. 19(11), pp. 495-497, December 1971.
3. Yablonovitch, E., Flytzanis, C., Bloembergen, N. "Anisotropic Interference of Three-Wave and Double Two-Wave Frequency Mixing in GaAs," Phys. Rev. Lett., Vol. 29(13), pp. 865-868, September 1972.
4. Yablonovitch, E., Bloembergen, N. "Avalanche Ionization and the Limiting Diameter of Filaments Induced by Light Pulses in Transparent Media," Phys. Rev. Lett., Vol. 29(14), pp. 907-910, October 1972.
5. Yablonovitch, E. "Nonlinear Optics with the CO_2 Laser," PhD. Thesis, Harvard University, Division of Engineering and Applied Physics (1972).
6. Fradin, D.W., Yablonovitch, E., Bass, M. "Confirmation of an Electron Avalanche Causing Laser-induced Bulk Damage at 1.06um," Appl. Optics, Vol. 12(4), pp. 700-709, April 1973.
7. Yablonovitch, E., Goldman, L.; Richfield, D.; and Bloembergen N., "Studies in Laser safety of new high-output systems. II. TEA CO_2 laser impacts," (Optics and Laser Technology, vol.5, (no.2), p.58-9, April 1973.
8. Yablonovitch, E. "Similarity Principles for Laser-Induced Breakdown in Gases," Appl. Phys. Lett., Vol. 23(3), pp. 121-122, August 1973.
9. Yablonovitch, E. "Spectral Broadening in the Light Transmitted through a Rapidly Growing Plasma," Phys. Rev. Lett., Vol. 31(14), pp. 877-879, October 1973.
10. Yablonovitch, E. "Self-Phase Modulation of Light in a Laser-Breakdown Plasma," Phys. Rev. Lett., Vol. 32(20), pp. 1101-1104, May 1974.
11. Yablonovitch, E. "Self-Phase Modulation and Short-Pulse Generation from Laser-Breakdown Plasmas," Phys. Rev. A, Vol. 10(5), pp. 1888-1895, November 1974.
12. Yablonovitch, E., Goldhar, J. "Short CO_2 Laser Pulse Generation by Optical Free Induction Decay," Appl. Phys. Lett., Vol. 25(10), pp. 580-582, November 1974.
13. Kwok, H-S., Yablonovitch, E. "CO_2 Oscillator-Pulse Shaper-Amplifier System Producing 0.1 J in a 500 psec Laser Pulse," Rev. Sci. Instrum., Vol. 46(7), pp. 814-816, July 1975.
14. Yablonovitch, E. "Generation of a Short Optical Pulse of Arbitrary Shape and Phase Variation," IEEE J. Quantum Electron., Vol. QE-11, pp. 789-791, September 1975.
15. Yablonovitch, E. "Plasma Resonance in the X-Ray Emission from Gaseous Laser Targets," Phys. Rev. Lett., Vol. 35(20), pp. 1346-1349, November 1975.
16. Kwok, H.S., Yablonovitch, E. "Electrical Triggering of an Optical Breakdown Plasma with Subnanosecond Jitter," Appl. Phys. Lett., Vol. 27(11), pp. 583-585, December 1975.
17. Kolodner, P., Yablonovitch, E. "Proof of the Resonant Acceleration Mechanism for Fast Electrons in Gaseous Laser Targets," Phys. Rev. Lett., Vol. 37(26), pp. 1754-1757, December 1976.
18. Yablonovitch, E., "Collisionless Multiphoton Dissociation of SF6: A Statistical Thermodynamics Process," The Significance of Nonlinearity in the Natural Sciences, pp. 207-226, 1977 (B. Kursunoglu, A. Perlmutter, L.F. Scott, eds., Plenum, New York)

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20. Kwok, H.S., Yablonovitch, E. "30-psec CO_2 Laser Pulses Generated by Optical Free Induction Decay," Appl. Phys. Lett., Vol. 30(3), pp. 158-160, February 1977.
21. Black, J., Yablonovitch, E. "Avalanche Initiating Electron Produced by Laser-Induced Tunneling," IEEE J. of Quantum Electron., pp. 117-119, April 1977.
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23. Black, J.G., Yablonovitch, E., Bloembergen, N. "Collisionless Multiphoton Dissociation of SF6: A Statistical Thermodynamic Process,", Phys. Rev. Lett., Vol. 38(20), pp. 1131-1134, May 1977.
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27. Bloembergen, N., Yablonovitch, E. "Infrared-Laser-Induced Unimolecular Reactions," Physics Today, Vol. 31(5), pp. 23-30, May 1978.
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41. Yablonovitch, E. "Statistical Ray Optics," J. of the Opt. Soc. Am., Vol. 72, pp. 899, 1982.
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