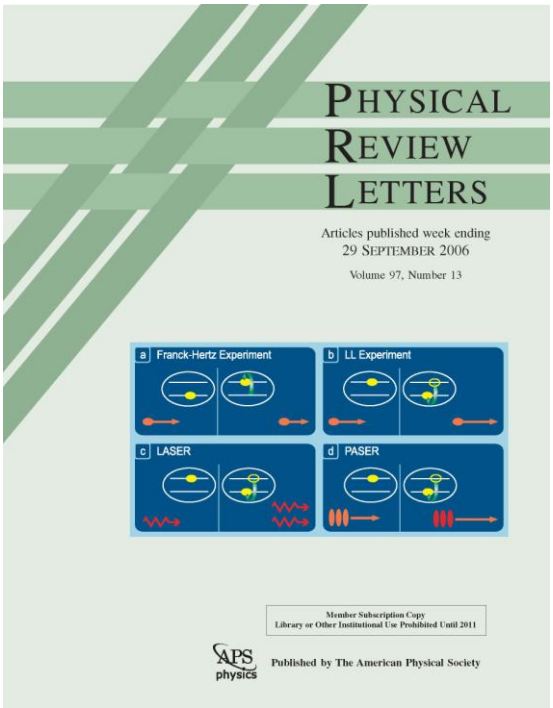
Levi Schächter graduated from the Electrical Engineering [B.Sc. (1983), M.Sc.(1985) and D.Sc.(1988)] and Physics [B.A. (1985)] Departments of the Technion – Israel Institute of Technology. Currently, he is a Professor at the Department of Electrical Engineering, Technion. At the Technion, he established theoretical and experimental activity on advanced acceleration concepts and radiation sources as well as a university-scale experiment on acceleration of electrons within the framework of the Electrodynamics Laboratory he is heading.

Professor Schächter has made many fundamental contributions to the understanding of the interaction of waves and electrons in high-power traveling wave tubes, electron emission from ferro-electric materials, particle acceleration by stimulated emission of radiation (PASER), conceptual design of an optical linear collider relying on Bragg acceleration structure.



During the years, Levi Schächter was awarded a number of prizes and fellowships for his research, among them: Guttwirth Prize, Fellowship of Japan Society for the Promotion of Science (JSPS), Rothschild Fellowship and IEEE Prize (Israel Branch). He is a Fellow of the American Physical Society *"For his contributions to particle acceleration at optical wavelength and in particular for developing the concept of particle acceleration by stimulated emission of radiation (PASER).* Between 1999-2000 he was a Visiting Professor with the School of Electrical Engineering of Cornell University and between 2006-2007 he was a Visiting Professor with the Laboratory of Elementary Particles Physics of Cornell University.

Research:

Electrodynamics
Advanced Acceleration Concepts
Effects of Electromagnetic Radiation on the Human Body
Novel Paradigms of Solar Energy Conversion

Teaching Activities:

Electromagnetic fields	(undergraduate)
Energy conversion	(undergraduate)
Introduction to circuit theory	(undergraduate)
Semiconductor devices	(undergraduate)
Quantum mechanics	(undergraduate and graduate)
Microwaves	(undergraduate and graduate)
Physics of semiconductors	(undergraduate and graduate)
Waves in periodic structures	(graduate)
Radiation sources based on free electrons	(graduate)

Alumni:

Samer Banna	M.Sc. (2000),	Ph.D. (2004)
Alon Grineneko	M.Sc. (2003)	
Assaf Lahav		Ph.D. (2006)
Amit Mizrahi	M. Sc.(2004),	Ph.D. (2007)

Plenary or Invited Talks (past 5 years):

1. *Constraints on structure-based laser acceleration*,
   ICFA workshop on High Brightness Beams, Sicily, Italy, October 9-15 (2005)
2. *Constraints on Structure-Based Optical Accelerators*
   ICFA 38th Advanced Dynamics and 9th Novel Accelerators Joint Workshop on Laser Beam Interactions , Taipei, Taiwan, December 2005
3. *Experimental Evidence of Direct Acceleration by Stimulated Emission of Radiation* AAC'06, Advanced Accelerator Concepts 12th Workshop, Lake Geneva, WI, July 2006.
4. *Experimental Evidence of Direct Acceleration by Stimulated Emission of Radiation* PAC'07, Particle Accelerator Conference, Albuquerque, NM, June 2007.
5. *Optical passive and active acceleration structures: a tutorial*; Photonics West'08, San Jose CA, January 2008
6. *PASER: options and perspectives*
   Advanced Acceleration Concepts Workshop, Annapolis, USA, June 2010

Selected Publications (past 5 years):

1. Dovrat A., Berenson R., Bormusov E., Lahav A., Lustman T., Sharon N. and Schächter L.
   Localized Effects of Microwave Radiation on the Intact Eye Lens in Culture Conditions
   Bioelectromagnetics; 26:398-405(2005).
2. Mizrahi A. and L. Schächter
   Mirror Manipulation by Attractive and Repulsive Forces of Guided Waves
   Optics Express, Vol. 13(24) 9804 (2005).
3. Banna S., Berezovsky V. and Schächter L.
   Experimental Observation of Direct Particle Acceleration by Stimulated Emission of Radiation
   Physical Review Letters, 97, 134801 (2006).
4. Banna S., Berezovsky V. and Schächter L.
   Particle Acceleration by Stimulated Emission of Radiation: Theory and Experiment
   Physical Review E, 74, 046501 (2006)
5. Mizrahi A. and Schächter L.
   Two-slab all optical spring,
   Optics Letters, Vol. 32(6), pp. 692-4 (2007)
6. Levi Schächter
   An analytic model for the electrostatic contribution of the electron cloud to the vertical tune-shift
   Nuclear Instr. and Methods in Physics Research A, . **592**(3). 125-140 (2008) .
7. A. Mizrahi, M. Horowitz and L. Schächter
   Torque and longitudinal force exerted by eigen-modes on circular waveguides
   Physical Review A 78: 023802 (2008).
8. L. Schächter
   Collisions of the second kind in a Penning trap
   Physical Review Letters, 102, 034801 (2009).
9. Karagodsky V., Schieber D. and Schächter L.
   Enhancing X-Ray Generation by Electron-Beam–Laser Interaction in an Optical Bragg Structure
   Physical Review Letters, **104**, 024801 (2010).
10. Valery Berezovsky, Hanna Alam and Levi Schächter
    Particle Acceleration by Stimulated Emission of Radiation in the Vicinity of a Solid-State Active Medium
    Physics Letters A.

Books:

Schächter L.
Beam-Wave Interaction in Periodic and Quasi-periodic Structures
Springer-Verlag , Heidelberg, 1997, 351 pages, 109 figures.

Carmel Y., J.A. Nation, G. Nusinovich, L. Schächter and E. Schamiloglu
High-Power Microwave Sources and Technologies
IEEE Press Series on RF and Microwave Technology
May 2001, R.J. Barker and E. Schamiloglu Editors,
Chapter 5: Relativistic Cerenkov Devices, pp. 116 -154

Schächter L.
Beam-Wave Interaction in Periodic and Quasi-periodic Structures
Springer-Verlag , Heidelberg, 2nd Edition to be published during 2011.

Table of Contents 2nd Edition (new topics marked with blue)