

# **BENJAMIN G. LEE**

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## **Education**

**Harvard University**, Cambridge, MA  
Ph.D. Candidate, Applied Physics

**California Institute of Technology**, Pasadena, CA  
B.S., Applied Physics, 2002

## **Research Experience**

**Harvard University**, Cambridge, MA

*Research Assistant*

*Prof. Federico Capasso, School of Engineering and Applied Sciences, 2005-present*

Design, fabrication and characterization of novel Quantum Cascade Laser devices for chemical sensing and gas/fluid spectroscopy.

**Harvard University**, Cambridge, MA

*Research Assistant*

*Prof. Robert Westervelt, Department of Physics, 2002-2005*

Imaging electron flow in two-dimensional electron gases.

**California Institute of Technology**, Pasadena, CA

*Research Assistant*

*Prof. Axel Scherer, Department of Electrical Engineering, 1999-2002*

Developed nanofabrication and lithographic techniques for diffractive optical elements with sub-wavelength features.

## **Work Experience**

**Harvard University**, Cambridge, MA

*Teaching Assistant*

Optoelectronics and Photonics (ES 173), Spring 2004

Led sections and graded homework for a course on optics, optoelectronic devices and lasers.

**Harvard University**, Cambridge, MA

*Teaching Assistant*

Complex and Fourier Analysis (APM 105a), Fall 2003

Led sections and graded homework for a course on methods of applied mathematics (complex analysis) and probability.

**California Institute of Technology**, Pasadena, CA

*Teaching Assistant*

Solid State Electronics (APh 9ab), 1999-2002

Led lab sections for a solid-state devices class with lab component – students fabricated and tested FET, BJT, LED, Schottky diode, MEMS.

**California Institute of Technology**, Pasadena, CA

*Teaching Assistant*

- Introduction to Optics (APh 23/24), 2000-2002

Led lab sections for an introductory optics class with lab component – lasers, holography, interferometry, diffraction, fiber optics.

## **Awards**

James Mills Pierce fellowship, Harvard University, 2002-7

Gordon Wu graduate fellowship, Princeton University, 2002-7 (declined)

W.M. Keck Nanobiotechnology fellowship, Cornell University, 2002-7 (declined)

associate member, Sigma Xi – Scientific Research Society, 2002

member, Tau Beta Pi honor society, 2002

Caltech Upper Class Merit Fellowship (full tuition), 2002

Governor-General's Academic Medal (Canada), 1998

## **Other Activities**

Harvard Graduate Student Canadian Club, president 2003-present

Graduate Student Council, treasurer 2003-2005, president 2005-2006

Harvard Energy Journal Club (energy and environmental issues), core member 2006-present

languages: English, Cantonese (fluent), French (intermediate), Mandarin (intermediate)

piano, grade 10 level with the Royal Conservatory of Music (Canada)

## Publications

### Widely tunable single-mode quantum cascade laser source for mid-infrared spectroscopy

**Benjamin G. Lee**, Mikhail A. Belkin, Ross Audet, Jim MacArthur, Laurent Diehl, Christian Pflugl, Douglas Oakley, David Chapman, Antonio Napoleone, David Bour, Scott Corzine, Gloria Hofler, Jerome Faist, Federico Capasso

*Applied Physics Letters* **91**, 231101 (2007)

-> paper was highlighted in online news coverage by Science Daily, PhysOrg, Nanotechwire, and Nanowerk.

### Intra-cavity absorption spectroscopy with narrow-ridge microfluidic quantum cascade lasers

Mikhail A. Belkin, Marko Loncar, **Benjamin G. Lee**, Christian Pflügl, Ross Audet, Laurent Diehl, Federico Capasso, David Bour, Scott Corzine, Gloria Höfler

*Optics Express* **15**, 11262 (2007)

### Single-mode laser action in quantum cascade lasers with spiral-shaped chaotic resonators

Ross Audet, Mikhail A. Belkin, Jonathan A. Fan, **Benjamin G. Lee**, Kai Lin, Federico Capasso, E. E. Narimanov, D. Bour, S. Corzine, J. Zhu, and G. Hofler

*Applied Physics Letters* **91**, 131106 (2007)

### Design and fabrication of photonic crystal quantum cascade lasers for optofluidics

M. Loncar, **Benjamin G. Lee**, L. Diehl, Mikhail A. Belkin, Federico Capasso, M. Giovannini and J. Faist, and E. Gini

*Optics Express* **15**, 4499 (2007)

### Microfluidic tuning of distributed feedback quantum cascade lasers

L. Diehl, **Benjamin G. Lee**, P. Behroozi, M. Loncar, Mikhail A. Belkin, Federico Capasso, T. Aellen, D. Hofstetter, M. Beck, J. Faist

*Optics Express* **14**, 11660 (2006)

### Pulsed- and continuous-mode operation at high temperature of strained quantum-cascade lasers grown by metalorganic vapor phase epitaxy

L. Diehl, D. Bour, S. Corzine, J. Zhu, G. Hofler, **Benjamin G. Lee**, Christine Y. Wang, M. Troccoli, and Federico Capasso

*Applied Physics Letters* **88**, 41102 (2006)

### Room temperature continuous-wave operation of quantum-cascade lasers grown by metal organic vapour phase epitaxy

M. Troccoli, S. Corzine, D. Bour, J. Zhu, O. Assayag, L. Diehl, **Benjamin G. Lee**, G. Hofler, and Federico Capasso

*Electronics Letters* **41**, 1059 (2005)