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EDUCATION

Ph.D., University of California, Berkeley.

Electrical Engineering, May 1999.

Research advisor: Professor Kam Lau.

Dissertation: Optoelectronics for High Speed Optical Communications Networks.

M.S., University of California, Berkeley.

Electrical Engineering, May 1997.

M.Sc., Oxford University, England.

Mathematics, November 1994.

Rhodes Scholar.

B.S., Swarthmore College.

Engineering, with distinction, June 1991.

B.A., Swarthmore College.

Mathematics, June 1991.

PROFESSIONAL EXPERIENCE

Associate Professor, Physics Department, Mount Holyoke College, MA, July 2005 – present.

Adjunct Associate Professor, Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, MA, 2005 – present. Member of the Graduate Faculty.

Visiting Scientist, Electronics Research Lab, Massachusetts Institute of Technology, Cambridge, MA, July 2002 – present.

Clare Boothe Luce Assistant Professor, Physics Department, Mount Holyoke College, MA, July 1999-2005.

Adjunct Assistant Professor, Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, MA, September 2004 – 2005. Member of the Graduate Faculty.

GRANTS

“Nanoscale 3D Thermal Profiling Inside Optoelectronic Devices,” National Science Foundation, 9/06-9/09.

Center for Hierarchical Manufacturing, University of Massachusetts at Amherst, subcontract 1/05-1/10.

“High Performance Thermal Profiling of Photonic Integrated Circuits,” National Science Foundation; 9/03-9/06.

“Stability and Polarization Control of Single Mode Vertical-Cavity Surface-Emitting Lasers Exposed to Optical Feedback;” NSF CAREER Grant; 6/02-6/07.

“Thermal Profiling for Optical Characterization of Photonic Integrated Circuits; Photonics Technology Access Program, National Science Foundation and DARPA, awarded 9/04.

Career Enhancement Fellowship; Woodrow Wilson National Fellowship Foundation; 6/02-6/03.

“The Role of Spin Coupling and Dichroism in Semiconductor Laser Dynamics;” Research Corporation; 6/02 – 6/04.

“Upgrade and Modernization of the Introductory Modern Physics Laboratory;” NSF Course, Curriculum, and Laboratory Improvement Program; 1/00 – 12/01.

“Characterization of Vertical Cavity Lasers in Practical Systems Applications;” ILX Lightwave University Donation Program; 2/00.

“Investigation of Modal Noise in VCSELs used with Multimode Fiber;” Council on Undergraduate Research; Summer 2000.

FELLOWSHIPS AND AWARDS

NSF CAREER Award, 2002-2007.

Optical Society of America’s Esther Hoffman Beller Medal, “for innovative teaching methods and involving undergraduate physics and engineering students in original, state-of-the-art, publishable research in optics and solid state physics,” 2004.

Scholarship Award, Mount Holyoke College, 2006.

Rhodes Scholar, 1991-1994.

Intel Foundation Graduate Fellowship, 1998-1999.

Optical Society of America New Focus \$10,000 Student Award, 1998.

University of California Mentored Research Fellowship, 1997-1998.

NSF Graduate Fellowship, 1994-1997.

McCabe Scholarship: Top Engineer of the Class of 1991, Swarthmore College, 1991.

Society of Women Engineers’ Lillian Moller Gilbreth Scholarship, 1990-1991.

Phi Beta Kappa, Tau Beta Pi, Sigma Xi.

PROFESSIONAL ACTIVITIES

Professional Memberships

Senior Member, IEEE (Institute of Electrical and Electronics Engineers)
Laser and Electro-Optics Society (LEOS) and Women in Engineering (WIE)
American Physical Society, Division of Laser Science
Optical Society of America

Editorial Advisory Board

Optics and Photonics News, Optical Society of America

Reviewer

Optics and Lasers in Engineering
Physics Review Letters
IEEE Journal of Quantum Electronics
Applied Physics Letters
Journal of Lightwave Technology
IEE Journal of Optoelectronics
Optical Communications
American Journal of Physics
Petroleum Research Fund, Type B funding proposal
National Science Foundation: panelist and reviewer
Research Corporation

Invited Talks

Massachusetts Institute of Technology, 2004.
University of Massachusetts at Amherst, Electrical Engineering Dept, 2004.
Mount Holyoke College Science Center Dedication, 2004.
Boston Science Museum, 2003.
Trinity College, 2003.
Woodrow Wilson National Fellowship Foundation, 2002.
Rickover Science Institute, 2002, 2003.
Mount Holyoke College, Unified Science Building Groundbreaking, 2001.
Middlebury College, 2001.
Williams College, 2001.
Annual Conference of Seven Sisters Presidents, 2000.
Optical Society of America Annual Meeting, 2000.
Williams College, 2000
University of Massachusetts at Amherst, Condensed Matter Seminar, 2000.
American Association of Physics Teachers Annual Meeting, 2000.
Amherst College, 1999.

COMMUNITY SERVICE

Rhodes Scholarship Selection Committee. State and District Committees, 1996-2004.
Steering Committee, Western Mass Equality, 2004-present.
Rickover Science Institute, 2002-2003.
Alumni Mentorship Program, UC Berkeley, 1996-1999.
US Embassy Speakers Bureau, London, England, 1991-1994.

UNDERGRADUATE EDUCATION CONFERENCES

Gordon Conference on Physics Research and Education: Quantum Mechanics, Mount Holyoke College, South Hadley, MA, 2002.

AAPT Workshop for New Physics Faculty, American Center for Physics, College Park, MD, 1999. NSF-sponsored program for new physics faculty; workshop discussed “new developments in physics curriculum and pedagogy.”

AAPT Annual Meeting 2000, Guelph, Ontario, July 2000. Invited panelist discussing teaching experiences of new faculty; contributed paper on developing role models for women physics students.

NSF Engineering Education Scholars Program, University of Wisconsin, Madison, WI, July 1996. NSF-sponsored program for new and future engineering faculty members. Program objectives included “strengthening preparation as teachers of undergraduates” and “improving teaching methods and examining the learning process.”

PATENTS

“High Performance CCD-based Thermoreflectance Imaging using Stochastic Resonance,” provisional application filed March 2005.

“Vertical-Cavity, Surface-Emitting Laser With an Intracavity Quantum-Well Optical Absorber,” US Patent 6,026,108, issued February 2000.

PUBLICATIONS (* undergraduate student)

M. Farzaneh, R. Amatya*, D. Lüerßen, K. Greenberg*, and J.A. Hudgings, “Two dimensional thermal imaging of vertical cavity surface emitting lasers,” submitted to *Photonics Technology Letters*, November 2006.

P.M. Mayer, D. Lüerßen, R.J. Ram, and J.A. Hudgings, “Theoretical and experimental investigation of the resolution and dynamic range of CCD-based thermoreflectance,” *Journal of the Optical Society of America A*, in press, September 2006.

E.W. Kapusta*, D. Lüerßen, and J.A. Hudgings, “Quantifying optical feedback into semiconductor lasers via thermal profiling,” *Photonics Technology Letters*, 18 (2), pp.310-312, 2006.

D. Lüerßen, R.J. Ram, A. Hohl-AbiChedid, E. Clausen, Jr., and J.A. Hudgings, “Thermal profiling: locating the onset of gain saturation in semiconductor optical amplifiers,” *Photonics Technology Letters*, 16 (7), pp.1625-1627, 2004.

J.A. Hudgings, K.P. Pipe, and R.J. Ram, “Thermal profiling for optical characterization of waveguide devices,” *Applied Physics Letters*, 83 (19), pp. 3882-3884, 2003.

P.A. Judge*, C.H.L. Quay*, and J.A. Hudgings, “Robustness to optical feedback of oxide-confined versus proton-implanted VCSELs,” *Applied Physics Letters*, 81 (21), pp.3933-3935, 2002.

- B.W. Packard and J.A. Hudgings, "Expanding college women's perceptions of physicists' lives and work through interactions with a physics careers website," *Journal of College Science Teaching*, 22 (3), pp.164-170, 2002.
- C.H.L. Quay*, I.Z. Maxwell*, and J.A. Hudgings, "Coherence collapse and redshifting in vertical-cavity surface-emitting lasers exposed to strong optical feedback," *Journal of Applied Physics*, 90 (12), pp.5856-5858, 2001.
- J.A. Hudgings, R.J. Stone, S.F. Lim, K.Y. Lau, and C.J. Chang-Hasnain, "Comparative study of the analog performance of a vertical cavity surface emitting laser under gain and cavity loss modulation," *Applied Physics Letters*, 77 (14), pp.2092-2094, 2000.
- J.A. Hudgings, L.A. Molter, and M. Dutta, "Design and modeling of passive optical switches and power dividers using non-planar coupled fiber arrays", *IEEE Journal of Quantum Electronics*, 36 (12), p.1438-1444, 2000.
- J.A. Hudgings, R.J. Stone, C.H. Chang, S.F. Lim, K.Y. Lau, and C.J. Chang-Hasnain, "Dynamic behavior and applications of a three-contact vertical cavity surface emitting laser," *IEEE Journal of Selected Topics in Quantum Electronics*, 5 (3), p.512-519, 1999.
- R.J. Stone, J.A. Hudgings, S. F. Lim, K.Y. Lau, and C.J. Chang-Hasnain, "Independent phase and magnitude control of an optically carried microwave signal with a three terminal vertical cavity surface emitting laser," *IEEE Photonics Technology Letters*, 11 (4), p.463-465, 1999.
- J.A. Hudgings, S.F. Lim, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Compact, integrated optical disk readout head using a novel bistable vertical cavity surface emitting laser," *Photonics Technology Letters*, 11 (2), p.245-247, 1999.
- J.A. Hudgings, K.Y. Lau, "Step-tunable all-optical wavelength conversion using cavity-enhanced four wave mixing," *IEEE Journal of Quantum Electronics*, 34 (8), p.1349-1355, 1998.
- J.A. Hudgings, R.J. Stone, S.F. Lim, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "The physics of negative differential resistance of an intracavity voltage-controlled absorber in a vertical cavity surface emitting laser," *Applied Physics Letters*, 73 (13), p.1796-1798, 1998.
- J.A. Hudgings, S.F. Lim, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Self-pulsations, bistability, and intracavity quantum well absorber modulation of VCSELs," in *Optoelectronic Integrated Circuits II, Proceedings of the SPIE*, vol. 3290, ed. S. Wang and Y. Park, 1998.
- S.F. Lim, J.A. Hudgings, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "VCSELs with a novel integrated quantum-well absorber," in *Vertical-Cavity Surface-Emitting Lasers II, Proceedings of the SPIE*, vol. 3286, ed. R.A. Morgan and K.D. Choquette, 1998.
- S.F. Lim, J.A. Hudgings, L.P. Chen, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Novel intracavity modulator integrated with a vertical-cavity surface-emitting laser," in *Trends in Optics*

and Photonics Series (TOPS), ed. C.J. Chang-Hasnain, Washington, D.C., Optical Society of America, 1997, vol. 15, p.48-52, 1997.

S.F. Lim, J.A. Hudgings, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Self-pulsating and bistable VCSEL with controllable intracavity quantum-well saturable absorber," *Electronics Letters*, 33 (20), p.1708-9, 1997.

S.F. Lim, J.A. Hudgings, L.P. Chen, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Modulation of a vertical-cavity surface-emitting laser using an intracavity quantum-well absorber," *IEEE Photonics Technology Letters*, 10 (3), p.319-321, 1997.

CONFERENCE PAPERS (* undergraduate student)

Maryam Farzaneh, Rajeev Ram, and Janice A. Hudgings, "Fiber-free characterization of photonic integrated circuits by thermorefectance microscopy," submitted to *CLEO 2007*, Baltimore, MD, May 2007.

Maryam Farzaneh, Reja Amatya*, Dietrich Lürßen, Katherine Greenberg*, Whitney Rockwell*, and Janice A. Hudgings, "Surface thermal imaging of VCSELs by thermorefectance microscopy," *MAR07 Meeting of the American Physical Society*, Denver CO, March 2007.

Maryam Farzaneh, Dietrich Lürßen, and Janice A. Hudgings, "Thermal profiling of photonic integrated circuits by thermorefectance microscopy," *CLEO 2006*, Long Beach, CA, May 2006.

Reja Amatya*, Dietrich Lürßen, Maryam Farzaneh, and Janice A. Hudgings, "Thermal lensing in oxide-confined, single-mode VCSELs," *CLEO 2006*, Long Beach, CA, May 2006.

Maryam Farzaneh, Dietrich Lürßen, Peter Mayer, Rajeev Ram, and Janice A. Hudgings, "2-D thermal imaging of the surfaces of optoelectronic devices by thermorefectance microscopy," *MAR06 Meeting of the American Physical Society*, Baltimore, MD, March 2006.

Dietrich Lürßen, Rajeev J. Ram, and Janice A. Hudgings, "Radial temperature profiling of VCSELs," *CLEO 2005*, Baltimore, MD, May 2005.

Evelyn Kapusta*, Dietrich Lürßen, and Janice A. Hudgings, "Using thermal profiling to quantify optical feedback into semiconductor lasers," *CLEO 2005*, Baltimore, MD, May 2005.

Janice Hudgings and Rajeev Ram, "High resolution thermal profiling of semiconductor lasers," *IEEE/LEOS Semiconductor Laser Workshop*, Baltimore, MD, May 2005.

Dietrich Lürßen, Janice A. Hudgings, Peter M. Mayer, and Rajeev J. Ram, "Nanoscale thermorefectance microscopy with 10mK temperature resolution using stochastic resonance," *21st IEEE Semiconductor Thermal Measurement and Management Conference*, San Jose, CA, March 2005.

Dietrich Lürßen, Rajeev J. Ram, and Janice A. Hudgings, "2-D thermal imaging of the optical power distribution in photonic integrated circuits," *LEOS 2004*, Rio Mar, Puerto Rico, November 2004.

- Evelyn Kapusta*, Dietrich Lürßen, and Janice A. Hudgings, "Quantifying optical feedback into semiconductor lasers by thermal profiling," *Frontiers in Optics 2004*, Rochester, NY, October 2004.
- Bidita J. Tithi*, Elizabeth Fenstermacher*, Dietrich Lürßen, and Janice A. Hudgings, "Determining fiber coupling efficiency of a semiconductor optical amplifier without direct optical measurement," *Frontiers in Optics 2004*, Rochester, NY, October 2004.
- Dietrich Lürßen, Janice A. Hudgings, Rajeev J. Ram, Edward Clausen, Jr., and Angela Hohl-AbiChedid, "Thermal profiling of gain saturation in semiconductor optical amplifiers," *CLEO 2004*, San Francisco, CA, May 2004.
- J.A. Hudgings, K.P. Pipe, and R.J. Ram, "Wafer scale profiling of photonic integrated circuits," *CLEO 2003*, Baltimore, MD, June 2003.
- P.A. Judge*, C.H.L. Quay*, and J.A. Hudgings, "Sensitivity to optical feedback of oxide-confined versus proton-implanted VCSELs," *2002 Digest of the LEOS Summer Topical Meetings*, Mont Tremblant, Quebec, July 2002.
- P.A. Judge*, C.H.L. Quay*, and J.A. Hudgings, "Comparative study of the optical feedback sensitivity of oxide-confined vs. proton-implanted VCSELs," *CLEO 2002*, Long Beach, CA, May 2002.
- K.M. Boates* and J.A. Hudgings, "Reduction of modal noise in multimode fiber systems employing VCSELs versus low-coherence edge-emitting lasers," *OSA Annual Meeting 2001*, Long Beach, CA, October 2001.
- J.A. Hudgings and B.W. Packard⁺, "Integrating physics career identity into the introductory physics curriculum," *AAPT Annual Meeting*, Guelph, Ontario, July 2000.
- I.M. Zaharieva*, C.Quay*, D. Weinberger, and J.A. Hudgings, "Feedback-dependent polarization behavior of VCSELs," *OSA Annual Meeting 2000*, Providence, RI, October 2000.
- C. Quay*, I.M. Zaharieva*, D. Weinberger, and J.A. Hudgings, "Coherence effects in VCSELs subjected to optical feedback," *OSA Annual Meeting 2000*, Providence, RI, October 2000.
- K.A. Walther*, M. Peterson⁺, and J. A. Hudgings, "Modeling of a three-contact VCSEL with an intracavity absorber," *OSA Annual Meeting 2000*, Providence, RI, October 2000.
- J.A. Hudgings, C.Q. Huei-Li*, I.M. Zaharieva*, and D. Weinberger, "The effect of optical feedback on vertical-cavity surface-emitting lasers," *OSA Annual Meeting 2000*, Providence, RI, October 2000.
- J.A. Hudgings, R.J. Stone, C.H Chang, K.Y. Lau, and C.J. Chang-Hasnain, "Comparative study of the analog performance of a vertical-cavity surface-emitting laser under gain and cavity loss modulation," *2000 Conference on Lasers and Electro-optics*, San Francisco, CA, May 2000.
- J.A. Hudgings, R.J. Stone, S.F. Lim, K.Y. Lau, and C.J. Chang-Hasnain, "Integrated phase and magnitude control of a microwave optical subcarrier using a three-contact vertical cavity surface emitting laser with an intracavity absorber," *OFC 1999*, San Diego, CA, February 1999.

- J.A. Hudgings, S.F. Lim, R.J. Stone, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Applications and device physics of a novel VCSEL with an intracavity quantum-well absorber," *OSA Annual Meeting*, Baltimore, MD, October 1998.
- J.A. Hudgings, S.F. Lim, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Frequency tuning of self-pulsations in a VCSEL with a voltage-controlled saturable absorber," *1998 Optical Fiber Comm. Conference*, San Jose, CA, 1998.
- R.J. Stone, J.A. Hudgings, S.F. Lim, G.S. Li, K.Y. Lau, and C.J. Chang-Hasnain, "Negative differential resistance of an intracavity voltage-controlled absorber in a vertical cavity surface emitting laser," *16th IEEE International Semiconductor Laser Conference*, Nara, Japan, October 1998.
- S.F. Lim, J.A. Hudgings, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Novel bistable VCSEL for efficient and compact optical pickup applications," *CLEO'98*, San Francisco, CA, May 1998.
- J.A. Hudgings and K.Y. Lau, "Step-tunable, all-optical wavelength conversion using cavity-enhanced four wave mixing", *1997 Optical Fiber Communication Conference*, Dallas, TX, February 1997.
- S.F. Lim, J.A. Hudgings, G.S. Li, W. Yuen, K.Y. Lau, and C.J. Chang-Hasnain, "Self-pulsating VCSEL with controllable quantum-well saturable absorber," *IEEE/LEOS'97 Summer Topical Meetings*, Montreal, Quebec, Canada, August 1997.

REFERENCES

(available on request)