

## **Constance J. Chang-Hasnain**

*Associate Dean for Strategic Alliances*, College of Engineering  
*Chair*, Nanoscale Science and Engineering Graduate Group  
*John R. Whinnery Distinguished Chair Professor*  
Electrical Engineering and Computer Science Department  
University of California, Berkeley, CA 94720  
Tel (650) 799-7355; email: cch@berkeley.edu

### **EDUCATION**

PhD	Electrical Engineering, University of California, Berkeley	1987
MS	Electrical Engineering, University of California, Berkeley	1984
BS	Electrical and Computer Engineering, University of California, Davis	1982

### **RESEARCH INTERESTS**

Fundamentals of Nanostructured Materials Synthesis, Properties and Devices;  
High contrast gratings and metastructures;  
Broadband optical communications and enabling devices;  
Vertical Cavity Surface-Emitting Lasers (VCSEL);  
Optical Micro-electro-mechanical structures (MEMS)

### **PROFESSIONAL EXPERIENCES**

*University of California, Berkeley, CA*

#### **College of Engineering**

2014 – Present *Associate Dean for Strategic Alliances*  
Managing international collaboration initiatives

2013 – 2014 *Director of China Partnerships*  
Managing and advising various collaboration programs in China

#### **Electrical Engineering and Computer Sciences Department**

2006 - Present *John R. Whinnery Distinguished Chair Professor*  
Graduated 28 PhDs, 7 MS students and 16 post-doctoral researchers since 1992 (beginning of teaching career); serving as the principal investigator (PI) or co-PI of more than \$65 M research grants and contracts.

1996 - Present *Professor*

#### **Nanoscale Science and Engineering Graduate Group**

2006 - Present *Chair*  
Co-founded the NSE Graduate Group in 2003 and served as an Executive Committee member from 2003-6 and Chair since 2006. The DE-NSE offers newly developed interdisciplinary graduate courses and innovative educational programs for graduate students. It has more than 60 Ph.D. students and 50 faculty members participating from 11 departments/programs in three colleges (Engineering, Chemistry and Physical Sciences).

2003 – 2006 *Founding Executive Committee Member*

#### **Director Position of Major Research Centers**

2006 - 2010 *Director and Principal Investigator*, National Science Foundation Interdisciplinary Graduate Education Research Traineeship Program (IGERT) on Nanoscale Science and Engineering  
This program awards 22 fellowships to graduate students from 11 departments at Berkeley. The mission is to develop multidisciplinary program that will prepare students to apply advances in nanoscale science and engineering towards system and applications, by integrating various complementary activities, encouraging

- collaboration among students from different backgrounds, and providing core/breath courses as a common platform.
- 2004 - 2009 *Faculty Director, DARPA-funded University Photonic Center - Center for Optoelectronic Nanostructured Semiconductor Technology (CONSRT)*  
CONSRT consists of 10 center professors from 5 universities with expertise ranging from materials, physics, chemistry, and devices. CONSRT's vision is to advance nanostructured optoelectronic materials and devices to enable breakthrough functionalities in sensing, imaging, processing and communication microsystems with greatly reduced power, size, and weight.

***Bandwidth10 Inc., Newark CA***

- 2011 - Present *Founder, Chief Scientist and Director of the Board*  
Co-founded the company; raised venture capital and developed 1550-nm VCSEL and tunable VCSEL technology; delivered sample products to 4 companies. The company currently has 9 employees.

***Bandwidth9 Inc., Fremont CA***

- 2000 - 2002 *Chief Technology Officer and Director of the Board*  
1998 - 2000 *Founder, Chairman, President and CEO (on leave from UC Berkeley)*  
Bandwidth9 Inc., Fremont CA  
Founded the company; As CEO of the company, raised venture capital and built fabrication and packaging facility, developed first long wavelength VCSEL and tunable VCSEL technology, and developed patent portfolio and negotiated license agreements. The company grew to 100,000 sq. ft. and 180 employees in 2002.

***Stanford University, Stanford, CA***

**Electrical Engineering Department**

- 1995 - 1996 *Associate Professor*  
1992 - 1995 *Assistant Professor*

***Bellcore, Red Bank, NJ***

- 1987 - 1992 *Member of Technical Staff, Applied Research Division*

***SDL, Inc., San Jose, CA***

- 1985 - 1987 *Research Engineer*

**AWARDS AND HONORS**

*Quantum Device Award, International Symposium on Compound Semiconductor, 2014*

Citation: For pioneering contributions to vertical cavity surface emitting lasers (VCSELs)

*Outstanding Research Award, Pan Wen Yuan Education Foundation 2013*

Citation: For pioneering contributions to vertical cavity surface emitting lasers (VCSELs)

*IEEE David Sarnoff Award 2011*

Citation: For pioneering contributions to vertical cavity surface emitting laser (VCSEL) arrays and tunable VCSELs

*Microoptics Award, Microoptics Conference (MOC), The Japan Society of Applied Physics 2009*

Citation: for distinguished works and contributions to develop and to promote microoptics technologies

*Guggenheim Memorial Foundation Fellowship, 2009*

*Humboldt Research Award, Alexander von Humboldt Stiftung Foundation 2009*

*Chang Jiang Scholar Endowed Chair Award, Ministry of Education, Peoples Republic of China, 2009*

*National Security Science and Engineering Faculty Fellowship, 2008*

*Nick Holonyak Jr. Award, Optical Society of America, 2007.*

Citation: for significant contributions to vertical cavity surface emitting laser arrays, injection locking and slow light

*Gilbreth Lecturer*, National Academy of Engineering, 2005

Citation: in recognition of outstanding contributions to the field of optical communications

*Honorary Member*, A. F. Ioffe Institute, St. Petersburg, Russia, 2005

*William Streifer Scientific Achievement Award*, IEEE Lasers and Electro-Optics Society, 2003.

Citation: for pioneering contributions to vertical cavity surface emitting lasers and VCSEL arrays for wavelength-division-multiplexing applications

*Miller Professor*, Miller Institute for Basic Research in Science, 2003-2004

*Curtis W. McGraw Research Award*, the American Society of Engineering Education, 2000.

*Fellow* of Institution of Electrical Engineers (IEE), 2003.

*Fellow* of IEEE, 1998.

Citation: For contributions to electro-optics in the area of monolithic semiconductor laser arrays.

*Fellow* of Optical Society of America, 1997.

Citation: For the design and analysis of vertical cavity surface emitting laser arrays and the invention of 2D wavelength-controlled optoelectronic devices.

*Presidential Faculty Fellow*, White House, 1994-7.

*Packard Fellow*, David and Lucile Packard Foundation, 1992-7.

*Distinguished Lecturer Award* of IEEE Lasers and Electro-Optics Society, 1994-5.

Citation Lecture: Vertical Cavity Laser Arrays

*Alfred P. Sloan Research Fellow*, Alfred P. Sloan Foundation, 1994-5.

*Reid and Polly Anderson Faculty Chair*, Stanford University, 1993-5.

*National Young Investigator Award*, National Science Foundation 1992-4.

*Young Alumnus of the Year*, University of California at Davis, 1993.

*Outstanding Young Electrical Engineer Award*, Eta Kappa Nu Honor Electrical Engineer Society, 1992.

Citation: by virtue of her notable contributions to electro-optics in the area of monolithic semiconductor laser arrays and leadership in professional societies.

*Best Paper Award*, The First Soviet-American Joint Workshop on the Physics of Semiconductor Lasers, Leningrad, USSR, May 1991.

Paper Title: Monolithic multiple wavelength tunable vertical cavity surface emitting laser array.

*Bellcore Interim Award*, Bellcore, 1990-91.

*D. J. Sakrison Prize* for the Best PhD Dissertation from U.C. Berkeley, 1989.

Thesis Title: High power performance and modulation of semiconductor lasers

*Quantum Fellowship* from the American Electronics Association, 1984-87.

*California Fellowship* in Microelectronics and Computer Sciences, 1982-84.

*First Place in the PhD Preliminary Examination*, EECS Dept., University of California Berkeley, 1983.

*Graduate with Highest Honor* from University of California, Davis, 1982.

*Departmental Citation*, Dept. EECS, University of California Davis, 1982.

*Second Prize* in IEEE Central Area Student Paper Contest, 1982.

*President's Undergraduate Fellowship*, UC Davis, 1981.

## **PRINCIPAL PROFESSIONAL SOCIETY OFFICES AND BOARD MEMBERSHIP**

US Advisory Committee to the International Commission on Optics, National Academy of Sciences  
2014-present

Scientific Advisory Council, Skolkovo Foundation, 2014-2016

OSA Centennial Advisory Panel, 2014-present

National Research Council Committee Study of “Optics and Photonics: Essential Technologies for Our Nation”, 2011 – 2012, providing visionary roadmap for future R&D and manufacturing in optics & photonics.

Editor-in-Chief, IEEE Journal of Lightwave Technologies, 2007-2012.

National Research Council Board on Assessment of NIST Programs, 2001 - 2006

Chair, National Research Council Panel for Electronics and Electrical Engineering, 2003 – 2006

Member of DOD Basic Research TARA Review Committee, 2000

US Air Force Scientific Advisory Board, 1997-1999.

Director At Large, Optical Society of America, 1998-2000.

Board of Governor, IEEE Lasers and Electro-Optics Society, 1993-6.

NSF Committee of Visitors for Electrical and Communications Systems Division, 1996.

NSF Panel on Investigation of Methods to Increase Representation of Women as Recipients of NSF Grants in Lightwave Technology, 1992

### **PROFESSIONAL SOCIETY MEMBERSHIPS**

Fellow, Institute of Electrical and Electronics Engineers (IEEE)

Fellow, Optical Society of America (OSA)

Fellow, The Institution of Electrical Engineers (IEE)

### **PUBLICATIONS AND PATENTS**

Authored 229 referred papers including 12 invited journal articles, and 8 book chapters; presented 18 Plenary talks, 200+ invited talks and 312 referred conference papers at major international conferences; awarded 38 US patents. Publications are cited over 6,116 and 11,442 times with an h-index of 38 and 50, according to ISI Web of Knowledge and Google Scholars, respectively.

A complete list is attached at the end.

### **CONSULTING EXPERIENCE WITH INDUSTRY**

1. Founder, Bandwidth10 Inc. 2010 – present

2. Expert witness, Alston & Bird LLP, 2013-present

In the matter of certain Optoelectronic Devices for Fiber Optic Communications, Components thereof, and Products containing same; US International Trade Commission Investigation No 337-TA-860. (Complainants: Avago Technologies Fiber IP (Singapore) Pte. Ltd., Avago Technologies General IP (Singapore) Pte. Ltd., and Avago Technologies U.S., Inc. Respondents: Mellanox Technologies, Inc. and Mellanox Technologies, Ltd.; and FCI Technologies.) Provided opinions regarding US Patent No. 5,596,595 for respondents. Deposition and trial experience.

Avago Technologies Fiber IP (Singapore) Pte. Ltd., Avago Technologies General IP (Singapore) Pte. Ltd., and Avago Technologies U.S. Inc. v IPtronics A/S and IPtronics, Inc; Civil Action No: 5:10-CV-02863-EJD (PSG), US District Court, N District of CA; Provided opinions regarding US Patent Nos. 5,359,447 and 6,947,456 for IPtronics. Claim Construction and Technical Tutorial.

3. Expert witness, Fish & Richardson P.C., 2013 - 2014

Re: Cambrian Science Corp. v. Cox Communications, Inc. et al. - Litigation

Expert consulting services to assist Fish & Richardson P.C., in its representation of Defendants Cox Communications, Inc., XO Communications Services, LLC, Level 3 Communications, LLC, 360networks (USA), Inc., Electric Lightwave, LLC dba Integra Telecom, IXC Holdings, Inc. dba Telekenex and Infinera Corporation (“Defendants”) in a patent infringement litigation involving Cambrian Science Corporation.

4. Expert witness, SNR Denton US LLP, 2012 – 2013

Avago Technologies Fiber IP (Singapore) Pte. Ltd. v. IPtronics Inc.; Civil Action No: 5:10-cv-02863-EJD (PSG). US District Court, N District of CA; Provided opinions regarding US Patent Nos. 5,359,447 and 6,947,456 for IPtronics. Claim Construction and Technical Tutorial.

5. Expert witness, Dickstein Shapiro LLP, 2012

Avago Technologies Fiber IP (Singapore) PTE. Ltd. v. Emcore Corporation; Case No. 3:08-cv-05394-SA (N.D. Ca.), U.S. Patent Nos. 5,359,447 and 5,761,229. Role of invalidity expert on contested patents and presentation of technology tutorial in the San Jose district court.

6. Expert witness, Quinn Emanuel Urquhart Oliver & Hedges LLP, 2009-2010  
In the matter of certain Optoelectronic Devices, Components thereof, and Products containing the same; US International Trade Commission Investigation No 337-TA-669. (Complainants: Avago Technologies Fiber IP (Singapore) Pte. Ltd. Respondents: Emcore Corporation.) Provided opinions regarding US Patent No 5,359,447 for respondents. Deposition and trial experience.
7. Expert witness, Howrey LLP, 2007-8
8. Technical consultant, Siemens Technology-to-Business Center, 2005
9. Chief Technology Officer and Director of the Board, Bandwidth9 Inc. 2000 – 2002
10. Technical Advisor, Luxnet Corp. 2000 – 2002
11. Technical Advisor, VueMetrics Corp. 2002 – 2004
12. Consultant for Baker & McKenzie
13. Founder, Chairman and CEO of Bandwidth9 Inc. 1998 – 2000
14. Technical consultant, Fuji-Xerox Corp.
15. Technical consultant, Coherent Inc.
16. Technical consultant, Optical Coating Laboratories Inc.
17. Technical consultant, Pacific Scientific (7/'97-6/'98)

## **PROFESSIONAL SOCIETY ACTIVITIES**

### ***Editor of Journals***

*Associate Editor*, Optica, OSA 2014-2016

*Panel of Editors*, ZTE Communications, 2013-2015

*Editor-in-Chief*, IEEE Journal of Lightwave Technologies, 2007-2012.

*Associate Editor*, IEEE Journal of Lightwave Technologies, 2005-2006.

*Guest Editor*, IEEE Journal of Selected Topics in Quantum Electronics on Semiconductor Lasers, August 1999

*LEOS Editor*, IEEE Circuits and Devices Magazine 1994-6.

*Associate Editor*, IEEE Circuits and Devices Magazine, 1991-1993.

### ***Conference Chair***

Asia Communications and Photonics Conference and Exhibition (ACP), 2014

Founding Co-Chair, Conference on High Contrast Metastructures, SPIE Photonics West Conference, San Francisco, 2012-2015

Founding Co-Chair, International Nano-Optoelectronics Workshop, Beijing and Lanzhou, China, July 29-August 11, 2007; Toyko, Japan, August 2-14, 2008; Stockholm and Berlin, August 2-15, 2009; Beijing, Changchun, China, August 1-15, 2010; St. Petersburg, Russia and Wurzburg, Germany, July 24-August 6, 2011; Berkeley and Stanford, August 8-15, 2012; Corsica, France, 8/19-30, 2013; St. Petersburg, 8/11-22, 2014

Founding General Co-Chair, OSA Topical Meeting of Slow and Fast Light, 2006-7.

General Co-Chair, Frontiers in Optics (FiO), OSA 2007.

General Co-Chair, Asia-Pacific Optical Communications (APOC), 2005.

Technical General Co-Chair, Asia-Pacific Optical Communications (APOC), 2004.

Conference Chair, Materials and Devices for Optical and Wireless Communications Conference, Asia-Pacific Optical and Wireless Communications (APOC), 2002, 2003.

General Co-Chair, Conference on Lasers and Electro-Optics (CLEO) 1999

CLEO is the largest international conference on lasers and electro-optics with more than 1000 invited & contributed papers and 10,000 attendees.

Program Co-Chair, Conference on Lasers and Electro-Optics (CLEO) 1997

Conference Chair, IEEE LEOS Summer Topical Meeting on Vertical Cavity Surface Emitting Lasers, 1997.

Conference Chair, Conference on High Speed Optoelectronics Devices and Systems, 1996.  
Chair, the 12th IEEE LEOS Semiconductor Lasers Workshop, 1995; Session Chair of the 8th  
Semiconductor Laser Workshop, 1991.

***Steering Committee***

Asia Communications and Photonics Conference and Exhibition (ACP), 2009-2012, 2013-14  
Asia-Pacific Optical Communications (APOC), 2007-8.  
Chair, Asia-Pacific Optical Communications (APOC), 2006-7.  
Conference of Lasers and Electro-Optics (CLEO), 2000-2002  
OSA Liaison of the Topical Meeting on Smart Pixels, 1995-7.  
OSA Liaison of the Topical Meeting on Quantum Optoelectronics, 1997.

***Organizing and Award Committee***

Member, IEEE Edison Medal Committee 2013-present  
Member, OSA Holonyak Award Committee 2009  
Member, IEEE William Streifer Scientific Award Committee 2007-9  
Member, OSA Adolph Lomb Medal 2007  
Young Scientist Award, Conference on Nanostructures: Physics and Technology, 2002, 2004  
Member, IEEE LEOS Fellows Committee, 1997.  
Organizing Committee, National Academy of Engineering's First Annual Symposium on  
Frontiers of Engineering, Irvine CA, Sept. 1995.  
Chair, OSA Beller Award Committee, 1997; Member, 1995-6.  
Committee Member, LEOS Quantum Electronics Award Committee, 1994.  
Chair, Optoelectronics Technical Group, OSA Technical Council, 1994-5; Vice Chair 92-4.  
Member, LEOS Technical Committee on Semiconductor Lasers 1994-1997  
Member, National Academy of Sciences' Delegation for US/USSR Interacademy Workshop on  
Physics of Semiconductor Lasers, 1991.

***Program Committee***

IEEE International Photonics Conferences, 2014  
26th International Conference on Indium Phosphide and Related Materials (IPRM2014)  
18th Microoptics Conference (MOC '13)  
Nanophotonics, the IEEE/LEOS Winter Topical Meeting Series, 2009  
Physics of Nanostructures: Physics and Technology, 2004-7  
European Conference on Optical Communications, 2004-5  
IEEE LEOS Annual Meeting, 2004-5  
International Conference on Photonics Research Materials, 2003  
Committee Member, Electronics Materials Committee 1997-2002  
IEEE LEOS Summer Topical Meeting on Vertical Cavity Surface Emitting Lasers, 2002  
Asia-Pacific Optical and Wireless Communications (APOC), 2001  
Optical Fiber Communications Conference, 1997-9.  
IEEE LEOS Annual Meeting, 1997-8  
International Semiconductor Laser Conference, 1994-6.  
International Electronic Devices Meeting, 1994, 1998.  
Topical Meeting on Semiconductor Lasers and Applications, 1995.  
Quantum Optoelectronics Meeting, 1995.  
Topical Meeting on Smart Pixels, 1994.  
Conference on Lasers and Electro-Optics CLEO, 1992-3.  
Integrated Photonics Research Conference, 1992-95.  
Topical Meeting on Smart Light Modulators and Applications, 1993.

**ACADEMIC COMMITTEE ACTIVITIES**

**UC Berkeley**

**Campus Level**

Faculty Equity Advisor Committee, 2013-present  
Committee on Research, 2013- present

Conflict of Interest Committee, 2005 - Present  
Chair of Executive Committee, Nanoscale Science and Engineering Graduate Group, 2006-present (Member 2003-5)  
Member, Deferred Maintenance Policy, 2006 - 2008  
Non-Ionizing Radiation Safety Committee 1998 - 2006  
Regents' and Chancellor's Scholarship Committee 2001- 2008

#### **College Level**

Committee on Broadening Participation during 2013-14  
Junior Transfer Admissions Review Committee 2013-present  
Executive Committee, Applied Science and Technology Graduate Group, 2002-2008  
Executive Committee, IGERT of Nano-Science and Engineering 2003-2010  
Electronic Research Laboratories Advisory Board 2001- 2006  
SUPERB Committee 2002-3

#### **Department Level**

EECS Faculty Search Committee 1999-04, 2013-14  
EECS Area Coordinator for Photonics 2013- present  
EECS Admissions Committee, Chair 1997, Member 1996, 2004, 2008-2013  
Undergraduate Education Committee 2013  
EECS Executive Committee, 2007-2009  
Faculty Search Committee, Nanoscale Science and Engineering 2006-7  
Faculty Search Committee, Material Science and Engineering 2003-4  
Faculty Search Committee, Mechanical Engineering 2002-3  
EECS Undergraduate Advisor 2001- Present  
AS&T Admissions Committee Chair 2004, Member 2003  
Co-Chair, EECS Faculty Retreat, 2003  
EECS Intellectual Property & Conflict of Interest Committee 1999-2000

**Stanford University** Academic Council Committee on Graduate Studies 1994-5  
School of Engineering Undergraduate Council 1994-5  
Electrical Engineering Academic Affairs Committee 1992-5  
Electrical Engineering Computer Committee 1993-5  
Laboratory Advisory Board of the Center for Integrated Studies (CIS) 1993-5  
Voluntary Freshmen Advisor, Otero Residence Hall 1992-3

### **Awards Received By Mentored Students**

#### **International Conferences**

1. James Ferrara, Finalist, 2014 Maiman Student Paper Competition
2. Thai Tran, Ross Tucker Award, AIME Electronic Materials Awards, 2004
3. Fanglu Lu, Best Poster Award, 3rd Annual Workshop on Photonic Technologies and Applications 2012.
4. Roger Chen, Best Student Award, 2010 IEEE Photonics Society Annual Meeting, Denver, Co.
5. Roger Chen, ISCS Student Award, 2010 International Symposium on Compound Semiconductors (ISCS '10), Kagawa, Japan.
6. Christopher Chase, Best Poster Award. Workshop on photonic technologies for access and interconnects 2010, Stanford, CA.
7. Devang Parekh, Infinera Best Student Paper Award Finalist, Optical Fiber Communication Conference and Exposition (OFC '09), San Diego.
8. M. Huang, Best Student Paper, 65th Annual Device Research Conference, 2007
9. Ye Zhou, Best Student Paper, Optical Society of America Frontiers in Optics Conference, 2007
10. Bala Pesala, Best Paper of Topical Meeting, OSA Slow and Fast Light Topical Meeting, 2007.

11. P. C. Ku, Ross Tucker Award, AIME Electronic Materials Awards, 2004
12. J.A. Hudgings, Best Student Paper Award, OSA Annual Meeting, 1998.

#### **Competitive Scholarships**

13. Roger Chen, National Defense Science and Engineering Fellowship (NDSEG), 2009
14. Weijian Yang, Maxine Pao Memorial Fellowship, UC Berkeley, 2009.
15. Xiaoxue Zhao, B.U. Chen Memorial Scholarship, Photonic Society of Chinese Americans, 2008
16. Mike Huang, B.U. Chen Memorial Scholarship, Photonic Society of Chinese Americans, 2007
17. Chih-Hao Chang, B.U. Chen Memorial Scholarship, Photonic Society of Chinese Americans, 2003
18. Yongan Wu, B.U. Chen Memorial Scholarship, Photonic Society of Chinese Americans, 1996.

#### **University-Level Awards**

19. Kun Li, Outstanding Graduate Student Instructor Award, 2014.
20. Kar Wei (Billy) Ng, Outstanding Graduate Student Instructor Award, 2013.
21. Linus C. Chuang, Outstanding Graduate Student Instructor Award, UC Berkeley, 2009.
22. Keith Toh, undergraduate research assistant, received Dean's Award for Academic Achievement for extraordinary intellectual accomplishments, Stanford University, 1995.

#### **Departmental-Level Awards**

23. Forrest Sedgwich, Leon Chua Award, EECS, University of California, Berkeley 2009.
24. Bala Pesala, Demetri Angelakos Award, EECS, University of California, Berkeley 2009
25. Xiaoxue Zhao, Leon Chua Award, 2007. EECS, University of California, Berkeley 2007.
26. Lukas Chrostowski, Demetri Angelakos Award, EECS, University of California, Berkeley 2004

#### **International Nano-Optoelectronic Workshop (iNOW) Awards**

27. Adair Gerke, Second Place, Best Poster Award, iNOW 2013
28. Fanglu Lu, Second Place, Best Poster Award, iNOW 2012
29. Weijian Yang, Third Place, Best Poster Award, iNOW 2012
30. Kun Li, Third Place, Best Poster Award, iNOW 2012.
31. Kar Wei (Billy) Ng, Honorable Mention, Best Poster Award, iNOW 2012.
32. James Ferrara, Second Place, Best Poster Award, iNOW 2011.
33. Wai Son (Wilson) Ko, Honorable Mention, Best Poster Award, iNOW 2011.
34. Vadim Karagodsky, Second Place, Best Poster Award, iNOW 2010.
35. Wai Son (Wilson) Ko, Second Place, Best Poster Award, iNOW 2010.
36. Christopher Chase, Third Place, Best Poster Award, iNOW 2010.
37. Roger Chen, Second Place, Best Poster Award, iNOW 2010.
38. Kar Wei (Billy) Ng, Third Place, Best Poster Award, iNOW 2010.
39. Michael Moewe, First Place, Best Poster Award, iNOW 2009.
40. Roger Chen, Second Place, Best Poster Award, iNOW 2009.
41. Christopher Chase, Third Place, Best Poster Award, iNOW 2009.
42. Wai Son (Wilson) Ko, Honorable Mention, Best Poster Award, iNOW 2009.
43. Christopher Chase, Second Place, Student Poster Award, iNOW 2008.
44. Roger Chen, Second Place, Student Poster Award, iNOW 2008.
45. Michael Moewe, Honorable Mention, Student Poster Award, iNOW 2008.
46. Linus C. Chuang, First Place, Student Poster Award, iNOW 2007.



## COMPLETE LIST OF PUBLICATIONS

### D.1 PLENARY TALKS

1. C. J. Chang-Hasnain, "Flat Photonics Using High-Contrast Metastructures", Asia Communications and Photonics Conference and IPOC 2013, Beijing, China, November 13, 2013
2. Connie Chang-Hasnain, "High Contrast Near-wavelength Gratings for Integrated Optics", International Conference on Fiber Optics and Photonics, Mandras, India, 9-12 December, 2012.
3. C. J. Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", SPIE Photonics West, Opto Symposium, San Francisco, January 2012.
4. C. J. Chang-Hasnain, "High-Contrast Photonics: New Platform for Integrated Optoelectronics", Asia Communications and Photonics Conference and Exhibition (ACP), Shanghai, November 2011.
5. C. J. Chang-Hasnain, "Nanolasers on Silicon for Chip-Scale Optoelectronics", International Compound Semiconductor Conference, Berlin, Germany, 22-26 May, 2011
6. C. J. Chang-Hasnain, "Nanoneedle Photonics on Lattice-Mismatched Substrates", 38th Symposium for Research Awardees, Humboldt Foundation, Bamberg, Germany, 18 - 21 March, 2010
7. C. J. Chang-Hasnain, "Nanoneedle Growth and Devices on Lattice Mismatched Substrates", International Symposium Semiconductor Heterostructures: Physics, Technology, Applications, St. Petersburg, Russia, 16-18 March 2010
8. C. J. Chang-Hasnain, "Optical Injection-Locking: 30 Years and Many More", Global COE International Symposium, Tokyo, Japan, March 9-10, 2010
9. C. J. Chang-Hasnain, "High-Contrast Grating: Bringing New Light to Optoelectronics", Microoptics Conference (MOC), The Japan Society of Applied Physics, October 27-30, 2009
10. C. J. Chang-Hasnain, "Nanoneedles and Subwavelength Grating: Enabling New Optoelectronic Technologies", St Petersburg Scientific Forum "Science and Society", Information Technologies, IV St Petersburg Meeting of Nobel Prize Laureates, September 21-25, 2009
11. C. J. Chang-Hasnain, "Nanowires, Nanoneedles and Nano-MEMS: Enabling New Optoelectronic Technologies", St Petersburg Scientific Forum "Science and Society", Nanotechnologies: research and education, III St Petersburg Meeting of Nobel Prize Laureates, June 22-27, 2008
12. C. J. Chang-Hasnain, "Progress and Prospects of Nano-Optoelectronic Devices for Optical Communications", Optical Fiber Communications and Integrated Optics Conference (OFCIO), Nanking, China, Nov. 7-10, 2007
13. C. J. Chang-Hasnain, "III-V Nanowires on Si for Optical Interconnects Applications", OSA Nano-Photonics, Hangzhou, China, 6/18-22, 2007
14. C. J. Chang-Hasnain, "III-V Nanowires on Si Substrates", International Symposium on Nanostructures: Physics and Technology, Novosibirsk, 25-29, June 2007
15. C. J. Chang-Hasnain, "High-Speed Performance of Directly Modulated, Injection-Locked VCSELs", International Workshop on PHysics & Applications of SEMiconductor LASERS, Metz, France, March 29-30, 2005
16. C. J. Chang-Hasnain, "Slowing and Stopping Light", SPIE Photonics West, Optoelectronics Symposium, January 2005.
17. C. J. Chang-Hasnain, "Slow Light in Semiconductors", Conference on Nanostructures: Physics and Technology, St. Petersburg, Russia, June 21-25, 2004
18. C. J. Chang-Hasnain, "Progress in Tunable VCSELs for WDM Applications", International Semiconductor Lasers Conference, Garmisch, Germany, September 30, 2002

### D.2 INVITED REFERRED JOURNAL PUBLICATIONS

1. C. J. Chang-Hasnain and W. Yang, "High contrast gratings for integrated optoelectronics," chapter in "Photonics Technology and Instrumentation," edited by David L. Andrews, John Wiley & Sons, Inc. 2014. (accepted)

2. Yi Rao, Weijian Yang, Chris Chase, Michael C. Y. Huang, D. P. Worland, Salman Khaleghi, Mohammad R. Chitgarha, Morteza Ziyadi, Alan E. Willner, and Connie J. Chang-Hasnain, "Long-Wavelength VCSEL Using High Contrast Grating", IEEE Journal Of Selected Topics In Quantum Electronics, Special Issue on Semiconductor Lasers, VOL. 19, NO. 4, 1701311,2013
3. C. J. Chang-Hasnain and W. Yang, "High-contrast gratings for integrated optoelectronics," Adv. Opt. Photon. 4, 379-440 (2012). **This paper was the number 1 download for all of OSA journals in October 2012, and for subscribed OSA journals in October and November 2012.**
4. Alan E Willner, Robert L Byer, Constance J Chang-Hasnain, Stephen R Forrest, Henry Kressel, Guillermo J Tearney, Charles H Townes, "Optics and Photonics: Key Enabling Technologies", Proceedings of the IEEE, vol. 100, pages 0018-9219, 2012
5. Connie J. Chang-Hasnain, "High-contrast gratings as a new platform for integrated optoelectronics", Semicond. Sci. Technol. **26** (2011) 014043 (11pp) doi:10.1088/0268-1242/26/1/014043
6. Anthony Ng'oma, Davide Fortusini, Devang Parekh, Weijian Yang, Michael Sauer, Seldon Benjamin, Werner Hofmann, Markus C. Amann, and Connie J. Chang-Hasnain, "Performance of a Multi-Gb/s 60 GHz Radio Over Fiber System Employing a Directly Modulated Optically Injection-Locked VCSEL," Journal of Lightwave Technology, Vol. 28, Iss. 16, pp. 2436-2444, April 2010.
7. Connie J. Chang-Hasnain, Ye Zhou, Michael C. Y. Huang, and Christopher Chase. "High-Contrast Grating VCSELs", Journal of Selected Topics in Quantum Electronics, Vol. 15, No. 3, pp. 869-878, June 2009.
8. Bala Pesala, Forrest Sedgwick, Alexander Uskov, and Connie Chang-Hasnain, "Ultrahigh-bandwidth electrically tunable fast and slow light in semiconductor optical amplifiers", JOSA B, Vol. 25, Issue 12, pp. C46-C54 (2008)
9. P.C. Ku, C. J. Chang-Hasnain and S.L. Chuang, "Slow light in semiconductor heterostructures", J. Phys. D, January 2007.
10. C. J. Chang-Hasnain and S.L. Chuang, "Slow and Fast Light in Semiconductor Quantum-well and Quantum-dot Devices", IEEE Journal of Lightwave Communications, Special Issue on Optoelectronics, 24, 12, pp. 4642-4654, December 2006.
11. Lukas Chrostowski, Xiaoxue Zhao, Connie J. Chang-Hasnain, "Microwave Performance of Optically Injection-Locked VCSELs", IEEE Transactions on Microwave Theory and Techniques, Volume 54, Issue 2, Part 2, pp.788 – 796, Feb. 2006
12. C. J. Chang-Hasnain, P.C. Ku, J. Kim, S.L. Chuang, " Variable Optical Buffer Using Slow Light in Semiconductor Nanostructures," Proceedings of the IEEE, Special Issue on Nanoelectronics and Nanoscale Processing, Vol. 91, 11, pp. 1884-97, Nov. 2003.
13. C. J. Chang-Hasnain, "Tunable VCSEL," IEEE Journal of Selected Topics in Quantum Electronics, Vol. 6, No. 6, pp. 978-987, Nov.-Dec. 2000.

### D.3 REFERRED JOURNAL PUBLICATIONS

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308. G. Hasnain, C.J. Chang-Hasnain, and G. H. Dohler, "A Monolithic Integrated Optical Circuit Using Doping Superlattices," CLEO, Baltimore, MD, pp. 437-438, April 1987.
309. C.J. Chang-Hasnain, J. Berger, D.R. Scifres, W. Streifer, J.R. Whinnery, and A. Dienes, "Narrow Single Lobed Emission with High Power and High Efficiency from an External Cavity Coupled Laser Array," CLEO, Baltimore, MD, pp. 403-404, April 1987.
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313. Chang-Hasnain, P. Worland, D.R. Scifres, "High Intensity Fiber-Coupled Laser Array, "Technical Digest of Optical Fiber Communication, Atlanta, GA, February 1986.
314. G.H. Dohler, J.N. Miller, C.J. Chang-Hasnain and G. Hasnain, "Optical Absorption and Non-linearities of Type-I Hetero-nipi Structures," American Physical Society Meeting, Las Vegas, Nevada, March 1986.
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#### **D.5 INVITED TALKS AT MAJOR CONFERENCES (111)**

316. C. J. Chang-Hasnain, "Nanophotonics Using III-V Nanopillar Grown on Silicon", 2013 Photonics Forum, National Taiwan University, December 13, 2013
317. C. J. Chang-Hasnain, "Flat Photonics Using High-Contrast Metastructures", 1000-Plan Institute of Integrated Photonics, Zhangjia Gang, China, December 8, 2013
318. Connie Chang-Hasnain, W.S. Ko, R. Chen and K.W. Ng, "Nanophotonic Link Using InGaAs Nanopillar LED and Detector Grown on Silicon", Institute for Advanced Study Focus Workshop on Advances in Semiconductor Nanowire based Photonics, Technische Universität München, Munich-Garching, Germany, October 27-28, 2013
319. C. J. Chang-Hasnain, "III-V Nanopillar Optoelectronics on Silicon", International Nano-Optoelectronics Workshop (iNOW), Cargèse, Corsica, France, August 20, 2013

320. C. J. Chang-Hasnain, "Tunable 1550-nm VCSEL", ZTE Communications, China, August 4, 2013
321. C. J. Chang-Hasnain, "Tunable 1550-nm VCSEL Using High Contrast Gratings", Presented at Beijing University of Posts and Telecommunications, Beijing, China, August 1, 2013
322. C. J. Chang-Hasnain, Y. Rao, C. Chase, M. C. Y. Huang, "Tunable 1550-nm VCSEL Using High Contrast Gratings", Qpeak Inc., May 15, 2013
323. T. Tran, H. Sun, K. W. Ng, K. Li, F. Lu, E. Yablonovitch and Connie Chang-Hasnain, "InP Micropillar Solar Cells Grown Directly on Silicon Substrates", 2013 UC Solar Research Symposium, UC Davis, May 2, 2013
324. C. J. Chang-Hasnain, "From Micro-optic Technologies and Nano-photonics Applications: Progress and Prospects", 2013 Franklin Institute Bower Award Symposium, Drexel University, April 24, 2013
325. C. J. Chang-Hasnain, "Nano-Lasers on Silicon - Bottom-up Integration of Lasers on Silicon via Nanomaterial Synthesis", Optical Fiber Communication Conference and Exposition (OFC) Workshop on Lasers for Silicon Photonics, March 17, 2013
326. C. J. Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", Stanford University, Feb. 28, 2013
327. W. Zhou, G. Dang, M. Taysing-Lara, and C. Chang-Hasnain, "Demonstration of a slow light high contrast metastructure cage waveguide", Proc. SPIE 8633, High Contrast Metastructures II, 863305 (2013).
328. Byung-Wook Yoo, Trevor K. Chan, Mischa Megens, Tianbo Sun, Weijian Yang, Yi Rao, David A. Horsley, Connie J. Chang-Hasnain, Ming C. Wu, "Optical phased array using single crystalline silicon high contrast grating for beamsteering", SPIE Photonics West, 8633-15, San Francisco 2013
329. C. J. Chang-Hasnain, "High contrast gratings: physics and applications," Proc. SPIE 8633, High Contrast Metastructures II, SPIE Photonic West, 8633-1, San Francisco 2013
330. Connie Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", Munushian Visiting Seminar Series, University of Southern California, November 15, 2012
331. Connie Chang-Hasnain, "High Contrast Metastructures for Silicon Photonics", Latin America Optics & Photonics Conference, Maresias Beach Hotel, São Sebastião, Brazil, 10- 13, November, 2012
332. Y. Rao, C. Chase, M. C.Y. Huang, S. Khaleghi, M. R. Chitgarha, M. Ziyadi, D. P. Worland, A. E. Willner, C. J. Chang-Hasnain, "Tunable 1550-nm VCSEL Using High Contrast Gratings", IEEE Photonics Conference, Burlingame, CA, September 23-27, 2012
333. Connie Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", SSO Seminar, Yale University, September 5, 2012
334. Connie Chang-Hasnain, "Nanopillar Optoelectronics on Silicon," Optical Interconnects Conference, Santa Fe, NM, May 20-23, 2012
335. Connie Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", Finisar, Sunnyvale, CA, March 12, 2012
336. Connie Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", ESI Scientific Advisory Board, Fremont, CA, May 11, 2012
337. Connie Chang-Hasnain, "Nanolasers grown on silicon," Optical Fiber Communication Conference (OFC), Los Angeles, California, March 4, 2012
338. Connie Chang-Hasnain, "Metastable, Single Crystalline Nanopillar Growth of III-V Compounds on Lattice-Mismatched Substrates", Laurence Berkeley National Laboratory, February 28, 2012
339. Connie Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", Danish Californian Workshop on Photonic Technologies, Berkeley, January 30, 2012
340. Connie Chang-Hasnain, "High-Contrast Grating VCSELs", SPIE Photonics West, VCSEL XVI, San Francisco, January 24, 2012

341. Connie Chang-Hasnain, "High Contrast Grating Optoelectronics", SPIE Photonics West, High Contrast Metastructures, San Francisco, January 21, 2012
342. Connie Chang-Hasnain, "Advances in VCSELs", NNIN International Winter School, Campinas, Brazil, January 12, 2012
343. Connie Chang-Hasnain, "Nanolasers on CMOS silicon," UKIERI Workshop, Cochin, India, December 15-16, 2011
344. Connie Chang-Hasnain, "Nanolasers Directly Grown on CMOS-Silicon", IME, December 13, 2011
345. C. J. Chang-Hasnain, "High-Contrast Metastructures for Integrated Optics", Global COE International Symposium, Tokyo Institute of Technology, Tokyo, Japan, December 12, 2011
346. C. J. Chang-Hasnain, "High-Contrast Photonics - New Platform for Integrated Optoelectronics", ACP2011, Shanghai, China, November 13, 2011
347. Connie Chang-Hasnain, "Nanolasers Directly Grown on CMOS silicon," Group IV Photonics, London, UK, September 15, 2011
348. Connie Chang-Hasnain, "Nanolasers on CMOS silicon," SPRC Symposium, Stanford, CA, September 13, 2011
349. C. J. Chang-Hasnain, "High-Contrast Gratings - New Platform for Integrated Optoelectronics ", University of Ghent, August 3, 2011
350. C. J. Chang-Hasnain, "Near Wavelength High-Contrast Metastructures", OECC, Kaohsiung, Taiwan, July 6, 2011
351. C. J. Chang-Hasnain, "Long Wavelength VCSELs", OECC, Kaohsiung, Taiwan, July 6, 2011
352. C. J. Chang-Hasnain, "Direct Growth of III-V Nanolasers and Optoelectronics on CMOS-Silicon", Aixtron, Aachen, Germany, June 28, 2011
353. C. J. Chang-Hasnain, "Nano-Optoelectronics on Silicon ", OSRAM, Regensburg, Germany, June 21, 2011
354. Connie Chang-Hasnain, "Nanopillar lasers on silicon," E-MRS Meeting, Nice, France, May 9, 2011
355. Connie Chang-Hasnain, "Nanopillar lasers on silicon," WOCC, Newark, NJ, April 16, 2011
356. C. J. Chang-Hasnain, "High-Contrast Grating (HCG) VCSEL ", Oracle, San Diego, CA, April 11, 2011
357. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Applied Materials Inc., March 29, 2011
358. C. J. Chang-Hasnain, "High-Contrast Gratings - New Platform for Integrated Optoelectronics", Luxnet, March 24, 2011
359. C. J. Chang-Hasnain, "Progress and Prospects of Nano-Photonics", ITRI, Taiwan, March 23, 2011
360. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Peking University, March 21, 2011
361. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", HP Labs, March 15, 2011
362. C. J. Chang-Hasnain, "High-Contrast Gratings - New Platform for Integrated Optoelectronics", Army Research Labs, February 25, 2011
363. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Intel, February 8, 2011
364. C. J. Chang-Hasnain, "Nano-Photonics on XYZ", Workshop on Multi-Scale Materials for DoD Applications, January 25, 2011
365. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Nanoscale Science and Engineering Graduate Group Seminar, UC Berkeley, January 21, 2011
366. Connie Chang-Hasnain, Roger Chen, Thai-Truong D. Tran, Kar Wei Ng, Wai Son Ko, "Nanopillar lasers on silicon," IEEE Photonics Society Winter Topicals (WTM '11), Keystone, CO, January 10-12, 2011.

367. C. J. Chang-Hasnain, "High-Contrast Gratings - New Platform for Integrated Optoelectronics", Huawei, January 7, 2011
368. C. J. Chang-Hasnain, "High-Contrast Gratings as a New Platform for Integrated Optoelectronics", Annual Meeting of IEEE Photonics Society, Denver CO, Nov. 8-11, 2010
369. Roger Chen, Thai-Truong D. Tran, Kar Wei Ng, Wai Son Ko, Linus C. Chuang, Forrest G. Sedgwick and Connie Chang-Hasnain, "All-Semiconductor Nanolasers on Silicon", Annual Meeting of IEEE Photonics Society, Denver CO, Nov. 8-11, 2010
370. C. J. Chang-Hasnain, "High-Contrast Gratings - New Platform for Integrated Optoelectronics", Hamamatsu, Hamamatsu, Japan, October 1, 2010
371. C. J. Chang-Hasnain, "High-Contrast Gratings as a New Platform for Integrated Optoelectronics", International Semiconductor Laser Conference, Kyoto, Japan, Sept. 26-30, 2010
372. C. J. Chang-Hasnain, "Nanopillar Lasers on Silicon and High Contrast Subwavelength Devices", EPFL, September 21, 2010
373. C. J. Chang-Hasnain, "Nanopillar Lasers on Silicon and High Contrast Subwavelength Devices", LPN CNRS, September 20, 2010
374. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", International Symposium on Frontiers of Nanoelectronics, September 8, 2010
375. C. J. Chang-Hasnain, "High Contrast Grating and Applications", Fraunhofer IOF, September 6, 2010
376. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Paul Drude Institute, September 2, 2010
377. C. J. Chang-Hasnain, "Nano-Photonics on Silicon Substrates", Laser Interaction with Matter International Symposium, August 16, 2010
378. C. J. Chang-Hasnain, "New Era of Optoelectronics Using Nanostructured Materials and Subwavelength Optics", Siemens, July 26, 2010
379. C. J. Chang-Hasnain, "New Era of Optoelectronics Using Nanostructured Materials and Subwavelength Optics", Fraunhofer IAF and ISE, July 23, 2010
380. C. J. Chang-Hasnain, "New Era of Optoelectronics Using Nanostructured Materials and Subwavelength Optics", PHILIPPS-UNIVERSITY MARBURG, July 19, 2010
381. C. J. Chang-Hasnain, "High-Contrast Gratings: A New Platform for Integrated Optoelectronics", 19th Annual Wireless and Optical Communications Conference, Shanghai, China, May 13, 2010
382. C. J. Chang-Hasnain, "New Era of Optoelectronic Integrated Circuits with Nano-Materials and Subwavelength Optics", Huawei, Shenzhen, China, April 26, 2010
383. C. J. Chang-Hasnain, "High-Contrast Gratings: A New Platform for Integrated Optoelectronics", 15th European Conference on Integrated Optics, Cambridge, UK, April 7-9, 2010
384. C. J. Chang-Hasnain, "Nanoneedle Photonics on Lattice- Mismatched Substrates", Humboldt Foundation Annual Symposium, Bamberg, Germany, March 19, 2010
385. C. J. Chang-Hasnain, "High Contrast Grating Based Optoelectronic Devices", SUBTUNE Workshop, February 25, 2010
386. C. J. Chang-Hasnain, "Nanostructured Materials and Optics: Enabling a New Era of Optoelectronic Technologies", Photonics Technologies for Access and Interconnects, January 29, 2010
387. C. J. Chang-Hasnain, "Rediscovery of Gratings: Novel Properties and Applications in VCSELs and Integrated Optoelectronics", Tsinghua University, January 24, 2010
388. C. J. Chang-Hasnain, "Nanostructured Materials and Optics: Enabling a New Era of Optoelectronic Technologies", National Taiwan University, January 7, 2010
389. C. J. Chang-Hasnain, "Nanostructured Materials and Optics: Enabling a New Era of Optoelectronic Technologies", Jilin University, December 14, 2009

390. C. J. Chang-Hasnain, "Nanostructured Materials: Enabling a New Era of Optoelectronic Technologies", Peking University, December 8, 2009
391. C. J. Chang-Hasnain, "Nanostructured Materials and Optics: Enabling a New Era of Optoelectronic Technologies", Zhijiang University, November 25, 2009
392. C. J. Chang-Hasnain, "Rediscovery of Gratings: Novel Properties and Applications in VCSELs and Integrated Optoelectronics", Asia Communications and Photonics, November 2, 2009
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