Jifeng Liu

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Professional Experiences

► 10/2010–present: Assistant Professor, Thayer School of Engineering, Dartmouth College
► 01/2007–09/2010: Postdoctoral Associate, Microphotonics Center, Massachusetts Institute of Technology

Education

► Ph. D., Electronic, Photonic and Magnetic Materials, Massachusetts Institute of Technology, Nov. 2006.
► M. S. with Honor, Materials Physics and Chemistry, Tsinghua University (Beijing, China), Jul. 2001.
► B. S., Materials Science and Engineering, Tsinghua University, Jul. 1999.

Research Interest

My major research field is optoelectronic materials and devices for future generations of ***energy-efficient*** information systems and ***clean energy technologies***, including

► Electronic-photonic integration based on silicon nanophotonics for high bandwidth, ultralow energy photonic data links in information technology (Green IT).
► Environmental benign nanomaterials, nanostructures and devices for renewable energy and infrared sensing.
► Nanophotonic solar-blind UV detectors for ozone depletion monitoring and chemical sensing.
► High temperature, nanostructured solar selective absorber coatings for high efficiency concentrated solar power (CSP) systems
► Low temperature growth of high crystallinity semiconductor thin films on amorphous layers for 3D photonic integration and cost-effective, high-efficiency solar cells.
► Self-assembled nanophotonic structures for light trapping in thin film solar cells.
► Thermophotovoltaic cells and selective emitters.
► Band-engineered semiconductors and phosphor materials for efficient solid-state lighting.
► Metallic and semiconducting silicide materials and devices for electronic and photonic applications.

Teaching

Instructor for Dartmouth undergraduate course ENGS 24 (spring term): Science of Materials
Instructor for Dartmouth graduate course ENGS 131: Science of Solid-State Materials
Instructor for Dartmouth graduate course ENGS 134: Nanotechnology
Co-instructor for Dartmouth graduate course ENGG 174: Energy Conversion (Solar Module)

Advising 1 M.S. and 3 Ph.D. students. Involved more than 10 undergraduate students in the lab research activities since 2011, including 4 women and 1 minority. Directed 4 Honors Theses.

Services at International Conferences and Committees

► Editorial Board, Annals of Materials Science and Engineering
► Review Editor and Topical Editor in Silicon Photonics, Frontiers in Materials
► NSF Panelist, Division of Materials Research (DMR) and Division of Electrical, Communications, and the Cyber systems (ECCS).
► Co-chair, Sub-Committee of Electronic-Photonic Synergy on Si, 2013 IEEE International Conference on Group IV Photonics.
► Vice Chair, Photonic Devices and Optoelectronic Integration Sub-Committee, International Conference on

Solid State Device and Materials (SSDM) (since 2012)
- ► Technical Program Committee Member, International SiGe Technology and Device Meeting (since 2012)
- ► Organizing Committee Member, the Electrochemical Society (ECS) SiGe, Ge and Related Compounds: Material, Processing, and Devices Symposium (since 2008)
- ► Co-chair, Ge on Si: Light Emission and Detection Session at 2011 European Materials Research Society Spring Meeting (Nice, France, May 2010)
- ► Co-Chair, Optoelectronics Session at 218th Electrochemical Society Meeting (Las Vegas, Oct. 2010)
- ► Chair, Silicon Photonics Session at 94th Optical Society of America (OSA) Annual Meeting: Frontiers in Optics 2010. (Rochester, Oct. 2010)
- ► Chair, Solar Cell Devices and Materials Session at 23rd IEEE Photonics Society Annual Meeting (Denver, Nov. 2010)

Reviewer for Scientific Journals:

I have been serving as a reviewer for more than 20 scientific journals published by the Nature Publishing Group (NPG), American Institute of Physics (AIP), the Institute of Electrical and Electronic Engineers (IEEE), the Optical Society of America (OSA), Elsevier, the Institute of Physics (IOP), and the Electrochemical Society (ECS), and the Minerals, Metals and Materials Society (TMS)

Publishing Group or Academic Society	Journal(s)
NPG	Nature Nanotechnology
	Nature Communications
AIP	Applied Physics Letters
	Journal of Applied Physics
IEEE	IEEE Journal of Quantum Electronics
	IEEE Journal of Selected Topics in Quantum Electronics
	IEEE Journal of Photonics Technology Letters
	Journal of Lightwave Technology
	IEEE Photonics Journal
OSA	Optics Express
	Optics Letters
	Applied Optics
	Journal of the Optical Society of America B
	Optical Materials Express
Elsevier	Materials Science and Engineering B
	Solar Energy Materials and Solar Cells
	Solid State Communications
	Thin Solid Films
	Journal of Crystal Growth
IOP	Science and Technology of Advanced Materials
	Semiconductor Science and Technology
ECS	Electrochemical and Solid-state Letters
TMS	Journal of Electronic Materials

In the News

- **Conference of Lasers and Electro-Optics (CLEO) 2014, Media Advisory**
  Symposia Highlight Photonics-based Applications
  Jun 10, 2014

- **Dartmouth Engineering Professor Receives NSF's CAREER Award**
  January 11, 2013

- **Thayer team redesigns solar tech.**
  The Dartmouth
  February 9, 2012

- **Thin Film Intelligence Brief**
  PV Insider
  January 31, 2012

- **Solar-Tectic LLC gets exclusive license for manufacturing single c-Si thin-films on ordinary glass**
  Global Solar Technology
  January 27, 2012

- **Computer World**
  Sep 13, 2011
  "5 tech breakthroughs: Chip-level advances that may change computing"
  By Brian Nadel

- **IEEE Technology News**
  Mar 10, 2011
  "Germanium-on-silicon laser for 21st century data links"
  By Mike Cooke

- **Semiconductor Today**
  Dec 13, 2010
  "Power, speed, and highlights of IEDM 2010"
  By Mike Cooke

- **Optics and Photonics News, Optical Society of America**
  May, 2010
  "The beginning of truly integrated lasers?"
  By Yvonne Carts-Powell

- **Photonics Spectra**
  April, 2010
  "Totally new physics" yields first germanium laser
  By Laura L. Marshall

- **The New York Times**
  March 14, 2010
  "NOVELTIES: An Express Lane From Camera to Computer - New York Times"
  By Brian Gormley

- **Semiconductor Today**
  February 8, 2010

"Germanium Lines up Bands for Laser Action"
By Mike Cooke

- **CNET News**
  February 5, 2010
  "New Germanium Laser Better for Computing"
  By Stephen Shankland

- **WIRED**
  February 4, 2010
  "Germanium Laser Breakthrough Brings Optical Computer Closer"
  By Priya Ganapati

- **Nature Photonics Technology Focus**
  March, 2007
  "Silicon modulators get a speed boost"

Invited Lectures:

[1] "Monolithic Ge and GeSn Gain Media and Lasers on Si"
2014 Optical Society of America (OSA) Integrated Photonics Research, Silicon, and Nanophotonics Conference (Jul.16, 2014)
Video available at http://www.opticsinfobase.org/abstract.cfm?uri=IPRSN-2014-IW4A.4 under "supplemental materials"

[2] "Ge-on-Si Integrated Photonics"
2014 Conference on Lasers and Electro-Optics (Jun. 9, San Jose, CA)
Video available at http://www.opticsinfobase.org/abstract.cfm?uri=CLEO_SI-2014-SM3O.1 under "supplemental materials"

[3] "Light up the Way of Energy Sustainability: from Green IT to Solar Energy"
The 3rd Emerging Information and Technology Association Young Investigator Conference (Aug. 2, Cambridge, MA.)

[4] "Towards High-Performance Monolithic Ge-on Si Lasers for Integrated Photonics"
2013 Optical Society of America (OSA) Integrated Photonics Research, Silicon, and Nanophotonics Conference (July 15 San Juan, Puerto Rico)
Video available at http://www.opticsinfobase.org/abstract.cfm?URI=IPRSN-2013-IM4A.2

[5] "Monolithic Ge laser and active integrated photonics on Si"
2013 Institute of Electronics, Information, and Communication Engineers (IEICE) General Conference (Mar. 19, Gifu, Japan)

[6] **"**Light up the way of energy sustainability"
Physics and Engineering Seminar, University of Massachusetts (Boston, Mar 6, 2013)

[7] ***"****Ge-on-Si lasers for large-scale photonic integration"*
2013 Japan Society for the Advancement of Science (JSPS) Core-to-Core Conference and Winter School on Silicon Photonics (Jan. 27 2013, Tokyo, Japan)

[8] *"Nanostructured Photonic Thin Films for Sustainable Energy*"
2012 SPIE Optical and Photonics Conference (Aug. 14 2012, San Diego, CA)

[9] *"Ge Laser and On-chip Electronic-photonic Integration"*
2012 (17th) Opto-Electronic Communication Conference (OECC) (Jul. 2 2012, Busan, South Korea.)

[10] *"Monolithic Active Silicon Photonics"*
2011 (4th) International Symposium on Atomically Controlled Fabrication Technology (Nov. 2, 2011, Osaka, Japan)

[11] *"Ge-on-Si Optoelectronics"*
2011 (7th) International Conference on Si Epitaxy and Heterostructures (Aug. 31, 2011, Leuven, Belgium)

[12] "Optically pumped Ge-on-Si Gain Media: Lasing and Broader Impact"
2011 MIT Microphotonics Center Fall Meeting (Oct. 11, Cambridge, MA)

[13] *"Nanophotonics for Sustainable Energy"*
2011 XXX (30th) General Assembly and Scientific Symposium of International Union of Radio Science (URSI) (Aug. 18, 2011, Istanbul, Turkey)

[14] *"Ge-on-Si Laser for Silicon Photonics"*
2011 European Conference on Lasers and Electro-Optics (E-CLEO) (May 25, 2011, Munich, Germany)

[15] *"Monolithic Active Ge-on-Si Photonic Devices"*
2011 European Material Research Society (E-MRS) Spring Meeting (May 10, 2011, Nice, France)

[16] *"Band-Engineered Ge-on-Si Lasers: Towards Electronic-Photonic Synergy"*
2010 International Electron Device Meeting (IEDM) (Dec. 6, 2010, San Francisco, USA)

[17] *"Ge-on-Si Integrated Photonics: New Tricks from an Old Semiconductor"*
2010 (23rd) IEEE Photonics Society Annual Meeting (Nov. 9 2010, Denver, USA)

[18] *"Monolithic Ge-on-Si Lasers"*
Frontiers in Optics, 2010 (94th) Annual Meeting of Optical Society of America (Oct. 25, 2010, Rochester, USA)

[19] *"Band-Engineered Ge-on-Si Lasers for Integrated Photonics"*
218th Electrochemical Society Meeting (Oct. 13 2010, Las Vegas, USA)

[20] *"Monolithic Ge-on-Si Lasers for Integrated Photonics"*
2010 IEEE International Conference on Group IV Photonics (Sept. 1 2010, Beijing, China)

[21] *"Optical Gain and Lasing from Band-Engineered Ge-on-Si"*
2010 Opto-electronics Communication Conference (OECC) (July. 2010, Sapporo, Japan)

[22] *"Monolithic Ge-on-Si Lasers for Electronic-Photonic Integration"*
University of Notre Dame, Solid State Seminar (Jan. 2010)

[23] *"Light up the Future of Si Microprocessors"*
215th Electrochemical Society Meeting (May. 2009, San Francisco, USA)

[24] *"Integrated Photonics for THz Applications"*
IEEE 802.15: Wireless Personal Area Networks Conference (Nov. 2008, Dallas, USA)

[25] *"Ge-based Active Devices for Si Photonics"*
4th IEEE/LEOS International Conference on Group IV Photonics (Sept. 2007, Tokyo, Japan)

[26] "CMOS-Compatible, High Performance Tensile Strained Ge P-I-N Photodetectors on Si"
2005 American Vacuum Society Symposium, New England Chapter, June 2005, Burlington, MA, USA)

Membership in Academic Societies

Member, IEEE, MRS, OSA, ECS, and ASEE.

Selected Awards and Honors

►**Excellence in Teaching Award, Thayer School of Engineering, Dartmouth College** (2014)

►**National Science Foundation (NSF) CAREER Award** (2013)

►**URSI Young Scientist Fellowship**, 2011 XXX (30th) General Assembly and Scientific Symposium of International Union of Radio Science (URSI)

►**Materials Research Society (MRS) Graduate Student Gold Award**, 2004 Materials Research Society (MRS) Fall Meeting, Dec. 2004.

► **2004 China's National Scholarship for Outstanding Graduate Students Studying Abroad** (awarded in May, 2005)

► **Master of Science with Honor,** Tsinghua University, 2001

►**Tung's Oriental Fellowship** (sponsored by the former Chief Executive of Hong Kong, Dr. Chee-hwa Tung), 2000

Publications

Google Scholar Profile: http://scholar.google.com/citations?user=6jvPkzUAAAAJ&hl=en

Excluding self-citations, the journal papers have been cited >2,500 times by Aug. 2014 according to Web of Science. The publications have been cited 4,600 times according to Google Scholar.

(a) Journal Papers:

[1] Xiaobai Yu, Xiaoxin Wang, Qinglin Zhang, Juchuan Li, and **Jifeng Liu**
"Oxidation-resistant, solution-processed plasmonic Ni nanochain-SiOx ($x < 2$) selective solar thermal absorbers"
Journal of Applied Physics 116, 073508 (2014)
http://scitation.aip.org/content/aip/journal/jap/116/7/10.1063/1.4893656

[2] **Jifeng Liu**
"Monolithically Integrated Ge-on-Si Active Photonics"
Photonics 1, 162-197 (2014) **(Invited Paper)**
http://www.mdpi.com/2304-6732/1/3/162/htm

[3] Hongtao Lin, Okechukwu Ogbuu, **Jifeng Liu**, Lin Zhang, Jurgen Michel, and Juejun Hu
"Breaking the energy-bandwidth limit of electro-optic modulators: theory and a device proposal"
Journal of Lightwave Technology 31, 4029-4036 (2013)

[4] Haofeng Li, Jeremy Brouillet, Alan Salas, Xiaoxin Wang, and **Jifeng Liu**,
"Low temperature growth of high crystallinity GeSn on amorphous layers for advanced optoelectronics,"
Optical Materials Express 3, 1385–1396 (2013).
http://www.opticsinfobase.org/ome/abstract.cfm?uri=ome-3-9-1385

[5] Y. Cai, Z. Han, X. X. Wang, R. Camacho-Aguilera, W. Yu, L. C. Kimerling, J. Michel, and **J. F. Liu**
"Analysis of Threshold Current Behavior for Bulk and Quantum Well Germanium Laser Structures"
IEEE Journal of Selected Topics on Quantum Electronics 19, 1901009 (2013) **(Invited paper)**,
http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=6470629

[6] X. Wang, L. C. Kimerling, J. Michel, and **J. F. Liu**
"Large inherent optical gain from the direct gap transition of Ge thin films"
Applied Physics Letters 102, 131116 (2013)
http://apl.aip.org/resource/1/applab/v102/i13/p131116_s1

[7] X. X. Wang, H. Li, Y. Cai, R. Camacho-Aguilera, L. C. Kimerling, J. Michel, and **J. F. Liu**
"Infrared absorption of n-type tensile-strained Ge-on-Si"
Optics Letters 38, 652 (2013)
http://www.opticsinfobase.org/ol/abstract.cfm?URI=ol-38-5-652

[8] X. X. Wang, H. Li, X. Yu, X. Shi, and **J. F. Liu**
"High-performance solution-processed plasmonic Ni nanochain-Al_2O_3 selective solar thermal absorbers"
Applied Physics Letters 101, 203109 (2012)
http://apl.aip.org/resource/1/applab/v101/i20/p203109_s1

[9] **J. F. Liu**, L. C. Kimerling, and J. Michel,
"Monolithic Ge-on-Si lasers for large-scale electronic-photonic integration"
Semiconductor Science and Technology 27, 094006 (2012)
(**invited paper for the Special Issue on the 50th Anniversary of Diode Lasers**)
http://iopscience.iop.org/0268-1242/27/9/094006

[10] **J. F. Liu**, R. Camacho-Aguilera, X. Sun, X. X. Wang, Y. Cai, L. C. Kimerling and J. Michel, "Ge-on-Si Optoelectronics"
Thin Solid Films 520, 3354 (2012) **(invited paper)**
http://www.sciencedirect.com/science/article/pii/S004060901101861X

[11] K. McComber, X. Duan**, J. Liu,** J. Michel and L. C. Kimerling, "Single-Crystal Germanium Growth on Amorphous Silicon",
Advanced Functional Materials 22, 1048 (2012) **(selected for frontispiece)**
http://onlinelibrary.wiley.com/doi/10.1002/adfm.201290025/abstract
http://onlinelibrary.wiley.com/doi/10.1002/adfm.201102015/abstract

[12] X. X. Wang and **J. F. Liu**
"Step-Coupler for efficient waveguide coupling to Ge/Si avalanche photodetectors"
IEEE Photonics Technology Letters 23, 146 (2011)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5643100&tag=1

[13] X. Sheng, **J. F. Liu**, I. Kozinsky, A. M. Argawal, J. Michel, and L. C. Kimerling
"Design and non-lithographic fabrication of light trapping structures for thin film silicon solar cells"
Advanced Materials 23, 843 (2011)
http://onlinelibrary.wiley.com/doi/10.1002/adma.201003217/abstract

[14] X. Sheng, **J. F. Liu**, N. Coronel, A. Argawal, J. Michel and L. C. Kimerling,
"Integration of self-assembled porous alumina and distributed Bragg reflector for light trapping in Si photovoltaic devices"
IEEE Photonics Technology Letters 22, 1394 (2010)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=5523897

[15] J. Michel, **J. F. Liu,** and L. C. Kimerling
"High-Performance Ge-on-Si Photodetectors"
Nature Photonics 4, 527 (2010) **(invited Review)**
http://www.nature.com/nphoton/journal/v4/n8/abs/nphoton.2010.157.html

[16] D. Underwood, B. Salvachua-Ferrando, R. Stanek, D. Lopez, **J. F. Liu,** J. Michel and L. C. Kimerling,
"New optical technology for low mass intelligent trigger and readout"
Journal of Instrumentation 5, C07011 (2010)
http://iopscience.iop.org/1748-0221/5/07/C07011

[17] **J. F. Liu,** X. C. Sun, L. C. Kimerling and J. Michel
"Ge-on-Si laser operating at room temperature"
Optics Letters 35, 679 (2010) (**#2 on "Top Download" list in March, 2010)**
http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-35-5-679

[18] X. C. Sun, **J. F. Liu**, L. C. Kimerling and J. Michel
"Towards a germanium laser for integrated silicon photonics"
IEEE Journal of Selected Topics on Quantum Electronics 16, 124 (2010) ***(invited paper)***
http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05286843

[19] **J. F. Liu,** X. C. Sun, L. C. Kimerling and J. Michel
"Direct gap Optical Gain of Ge-on-Si at room temperature"
Optics Letters 34, 1738 (2009)
http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-34-11-1738

[20] X. C. Sun**, J. F. Liu,** L. C. Kimerling and J. Michel
"Direct gap photoluminescence of n-type tensile-strained Ge-on-Si"
Applied Physics Letters 95, 011911 (2009)
http://apl.aip.org/resource/1/applab/v95/i1/p011911_s1

[21] **J. F. Liu,** X. Sun, Y. Bai, K. E. Lee, L. C. Kimerling and J. Michel
"Efficient above-band-gap light emission in germanium" ***(invited paper)***
Chinese Optics Letters 7, 271 (2009)
http://www.opticsinfobase.org/col/abstract.cfm?uri=col-7-4-271

[22] X. C. Sun**, J. F. Liu,** L. C. Kimerling and J. Michel
"Room-temperature direct bandgap electroluminesence from Ge-on-Si light-emitting diodes"
Optics Letters 34, 1198 (2009)

http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-34-8-1198

[23] **J. F. Liu,** M. Beals, A. Pomerene, S. Bernardis, R. Sun, J. Cheng, L. C. Kimerling and J. Michel
"Waveguide-integrated, ultra-low energy GeSi electro-absorption modulators"
Nature Photonics 2, 433 (2008)
http://www.nature.com/nphoton/journal/v2/n7/full/nphoton.2008.99.html

[24] L. Zeng, P. Bermel, Y. Yi, B. A. Alamariu, K. A. Broderick, **J**. **Liu**, C. Hong, X. Duan, J. Joannopoulos, and Lionel C. Kimerling
"Demonstration of enhanced absorption in thin film Si solar cells with textured photonic crystal back reflector"
Applied Physics Letters 93, 221105 (2008)
http://apl.aip.org/resource/1/applab/v93/i22/p221105_s1

[25] D. D. Cannon**, J. F. Liu,** D. T. Danielson, S. Jongthammanurak, U. U. Enuha, K. Wada, J. Michel, and L. C. Kimerling
"Germanium-rich silicon-germanium films epitaxially grown by ultrahigh vacuum chemical-vapor deposition directly on silicon substrates"
Applied Physics Letters 91, 252111 (2007)
http://apl.aip.org/resource/1/applab/v91/i25/p252111_s1

[26] **J. F. Liu,** X. C. Sun, D. Pan, X. X. Wang**,** L. C. Kimerling, T. L. Koch and J. Michel,
"Tensile-strained, n-type Ge as a gain medium for monolithic laser integration on Si"
Optics Express 15, 11272 (2007)
http://www.opticsinfobase.org/oe/abstract.cfm?uri=oe-15-18-11272

[27] N. N. Feng, J. Michel, L. Zeng, **J. F. Liu,** C. Y. Hong, L. C. Kimerling, and X. Duan
"Design of highly efficient light-trapping structures for think-film crystalline silicon solar cells"
IEEE Transactions on Electronic Devices 54, 1926 (2007)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=4277956

[28] D. Ahn, C. Y. Hong, **J. F. Liu,** M. Beals, L. C. Kimerling, and J. Michel
"High performance, waveguide integrated Ge photodetectors"
Optics Express 15, 3916 (2007)
http://www.opticsinfobase.org/oe/abstract.cfm?uri=oe-15-7-3916

[29] **J. F. Liu,** D. Pan, S. Jongthammanurak, K. Wada, L. C. Kimerling, and J. Michel,
*"Design of monolithically integrated GeSi electroabsorption modulators and photodetectors on an SOI platform***"**
Optics Express 15, 623 (2007)
http://www.opticsinfobase.org/oe/abstract.cfm?URI=oe-15-2-623

[30] S. Jongthammanurak, **J. F. Liu,** K. Wada, D. D. Cannon , D.T. Danielson, D. Pan, L. C. Kimerling and J. Michel,
"Large Electro-optic Effect in Tensile Strained Ge-on-Si Films"
Applied Physics Letters 89, 161115 (2006)
http://apl.aip.org/resource/1/applab/v89/i16/p161115_s1

[31] L. Zeng, Y. Yi, C. Hong, **J. F. Liu,** N. N. Feng, X. Duan, L.C. Kimerling and B. A. Alamariu,
"Efficiency Enhancement in Si Solar Cells by Textured Photonic Crystal Back Reflector"
Applied Physics Letters 89, 111111 (2006)
http://apl.aip.org/resource/1/applab/v89/i11/p111111_s1

[32] X.X. Wang**, J. F. Liu,** B. W. Cheng, J. Z. Yu, and Q. M. Wang
"Metal catalysis-free, direction-controlled planar growth of single-crystalline α-Si3N4 nanowires on Si (100) substrate"
Nanotechnology 17, 3989 (2006)
http://iopscience.iop.org/0957-4484/17/15/064/

[33] **J. F. Liu,** J. Michel, W. Giziewicz, D. Pan, D. D. Cannon, D.T. Danielson, S. Jongthammanurak, K. Wada, and L. C. Kimerling
"High-performance, tensile-strained Ge p-i-n photodetectors on a Si platform"
Applied Physics Letters 87, 103501 (2005)
http://apl.aip.org/resource/1/applab/v87/i10/p103501_s1

[34] **J. F. Liu,** D. D. Cannon, K. Wada, Y. Ishikawa, S. Jongthammanurak, D. T. Danielson, J. Michel, and L. C Kimerling
"Tensile strained Ge p-i-n photodetectors on Si platform for C and L band optical communications"
Applied Physics Letters 87, 011110 (2005)
http://apl.aip.org/resource/1/applab/v87/i1/p011110_s1

[35] Y. Ishikawa, K. Wada, **J. F. Liu,** D. D. Cannon, H. C. Luan, J. Michel, and L. C. Kimerling
"Strain-induced enhancement of near-infrared absorption in Ge epitaxial layers grown on Si substrate"
Journal of Applied Physics 98, 013501 (2005)
http://jap.aip.org/resource/1/japiau/v98/i1/p013501_s1

[36] S. Akiyama, F J. Grawert, **J. Liu,** K. Wada, G. K. Celler, L. C. Kimerling, and F. X. Kaertner
"Fabrication of highly reflecting epitaxy-ready Si–SiO_2 bragg reflectors"
IEEE Photonics Technology letters 17, 1456 (2005)
http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=01453642

[37] F. J. Grawert, J. T. Gopinath, F. Ö. Ilday, H. M. Shen, E. P. Ippen, F. X. Kärtner, S. Akiyama, **J. Liu,** K. Wada, L. C. Kimerling
"220-fs erbium-ytterbium:glass laser mode locked by a broadband low-loss silicon germanium saturable absorber"
Optics Letters 30, 329 (2005)
http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-30-3-329

[38] **J. F. Liu,** D. D. Cannon, K. Wada, Y. Ishikawa, D. T. Danielson, S. Jongthammanurak, J. Michel, and L. C Kimerling,
"Deformation potential constants of biaxially tensile stressed Ge epitaxial films on Si(100)",
Physical Review B 70, 155309 (2004)
http://prb.aps.org/abstract/PRB/v70/i15/e155309

[39] **J. F. Liu,** D. D. Cannon, K. Wada, Y. Ishikawa, D. T. Danielson, S. Jongthammanurak, J. Michel, and L. C. Kimerling,
"Silicidation-induced band gap shrinkage in Ge epitaxial films on Si",
Applied Physics Letters 84, 660 (2004).
http://apl.aip.org/resource/1/applab/v84/i5/p660_s1

[40] D. D. Cannon**, J. F. Liu,** Y. Ishikawa, K. Wada, D. T. Danielson, S. Jongthammanurak, J. Michel, and L. C. Kimerling,
"Tensile strained epitaxial Ge films on Si(100) substrates with potential applications in L-band telecommunications",
Applied Physics Letters 84, 906 (2004)
http://apl.aip.org/resource/1/applab/v84/i6/p906_s1

[41] O. I. Dosunmu, D. D. Cannon, M. K. Emsley, B. Ghyselen, **J. F. Liu,** L. C. Kimerling, and M. S. Unlu,
"Resonant cavity enhanced Ge photodetectors for 1550 nm operation on reflecting Si substrates"
IEEE Journal of Selected Topics in Quantum Electronics 10, 694 (2004)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=1343955

[42] Y. Ishikawa, K. Wada, D. D. Cannon, **J. F. Liu,** H. C. Luan, and L. C. Kimerling,
"Strain-induced band gap shrinkage in Ge grown on Si substrate",
Applied Physics Letters 82, 2044 (2003).
http://apl.aip.org/resource/1/applab/v82/i13/p2044_s1

[43] **J. F. Liu,** J. Y. Feng and W. Z. Li
"Reduction of the tensile stress in CoSi2 films by pre-deposition carbon ion implantation"
Nuclear Instrument & Methods in Physics Research B-Beam Interactions with Materials and Atoms 194, 289 (2002)
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