

Jifeng Liu

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Assistant Professor

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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

- ▶ Low temperature growth of high crystallinity semiconductor thin films on amorphous layers for monolithic 3D photonic integration and cost-effective virtual substrates towards high-efficiency solar cells.
- ▶ High temperature, antioxidation plasmonic solar selective absorber coatings for high efficiency concentrated solar thermal power (CSP) systems
- ▶ Self-assembled nanophotonic structures for light trapping in thin film solar cells and 2D materials.
- ▶ Electronic-photonic integration based on silicon nanophotonics for high bandwidth, ultralow energy photonic data links in information technology (Green IT).
- ▶ Thermophotovoltaic cells and selective emitters.
- ▶ Low-cost, highly machinable thermoelectric alloys based on earth abundant elements.

List of Sponsored Research Projects at Dartmouth

Total External Funding=\$2,241,884 (by Sep 2015), out of which **\$2,087,422** is from Liu's **Single PI or Lead PI Projects**.

Project Title	Funding Agency/ PI status	Funding Period	Funding Level
Thermodynamically Stable, High Temperature, Long-Term Antioxidation Cermet Solar Selective Absorbers from Low-Cost Solution Chemical Processing	DOE Single PI	9/1/2015- 8/31/2018	\$656,831
Collaborative Research: Modeling-Based Design of Freeze-Cast Hybrid Materials	NSF Co-PI	9/1/2015- 8/31/2018	\$67,096 for Liu and Research Staff out of \$361,318 at Thayer
Collaborative Research: Nanostructured Conductive Tin Oxide for High-Efficiency Light Trapping in Thin Films and Photonic Devices	NSF/ Lead PI	7/1/2015- 6/30/2018	\$299,994 (Liu's Share)
CAREER: Low-Temperature Growth Of High Crystallinity GeSn on Amorphous Materials for Advanced Optoelectronics	NSF, CAREER Award/ Single PI	2/1/2013- 1/31/2018	\$565,988

High Temperature Atmospherically Stable Plasmonic Nanochain Solar Selective Coating for Concentrating Solar Power	NSF SBIR, subcontracted from Norwich Technologies Single PI on University Side	7/1/2013-6/30/2014	\$39,586
Nanophotonic MOS Solar-Blind Avalanche UV Detectors	NSF Lead PI	9/1/2012-8/31/2015	\$ 366,220
Optical System Development for AxiSol High Efficiency Solar Collector	NHIRC/ UNH Single PI	1/1/2011-12/31/2012	\$107,130
Optical System Development for AxiSol High Efficiency Solar Collector	Axisol, Inc Single PI	1/1/2011-12/31/2012	\$28,455
Laser-Directed In-Plane Growth of Single Crystalline and Large-Grained Si Thin Films	Solar Tectic, LLC Single PI	9/4/2012-12/31/2012	\$11,976
Self-Assembled Sunlight-Trapping Fractal Nanostructures for 1\$/W Solar Electricity	Thayer Energy Initiative Single PI	9/1/2012-8/31/2014	\$95,527
Carrier Dynamics Studies on Band-Engineered Ge	ONR, subcontract from MIT Co-PI	1/1/2011-6/30/2011	\$87,366
Method of Growing Heteroepitaxial Single Crystal or Large Grained Semiconductor Films on Glass Substrates and Devices Thereon	Solar Tectic, LLC Single PI	8/1/2011-12/31/2011	\$11,242

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, 5 lectures)

Advising

- ▶ Advising 4 and co-advising 1 Ph.D. students. Graduated 1 M.S. student who won the Charles F. and Ruth D. Goodrich Prize (Andrew Wong, 2014).
- ▶ Directed 5 Senior Honors Theses.
- ▶ Advised **more than 50 undergraduate students** in the lab research activities through undergraduate research programs, Honors Theses, Exchange Program, ENGS 89/90, and ENGS 24 term projects since 2011. These include **16 women and 3 minority. Four (4) undergraduate students** have **co-authored journal papers** in my group.

Services at International Conferences and Committees

- ▶ Co chair, Emerging Technologies in Integrated Photonics, 2016 IEEE Photonics Society Summer Topical Meeting.
- ▶ 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).

- ▶ Chair, Photonics and Optoelectronics Workshop, 2015 Energy Materials Nanotechnology Summer Meeting.
- ▶ 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)

Services at Thayer School

- ▶ M.S./Ph.D. Committee (since 2011)
- ▶ Thayer Distinguished Lecture Committee (Visionaries in Technology Series, since 2012)
- ▶ Instructional Lab Committee
- ▶ Faculty Search Committee, Energy Materials (2014-2015)
- ▶ Faculty Search Committee, Computational Materials Science (2015-2016)
- ▶ Sub-committee on structures for graduate program

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), American Chemical Society (ACS), American Physical Society (APS), 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
ACS	ACS Photonics
	ACS Applied Materials and Interfaces
	Nano Letters
APS	Physical Review X
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 Solar Energy 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

- [**Dartmouth Engineering Professor Receives Award for Large-Scale, Low-Cost Solar Energy Technology**](#)
September 16, 2015
- **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:

More than 20 invited talks at international conferences since Sep. 2010.

- [1] "Direct Gap GeSn Optical Gain Media Towards Monolithic 3D Photonic Integration"
2015 Conference on Lasers and Electro-Optics, Pacific Rim (CLEO PR), (Busan, Korea, Aug. 25).
- [2] "GeSn Mid-IR Materials and Devices for 3D Photonic Integration"
2015 IEEE Summer Topical meeting (Nassau, Bahamas, July 15, 2015)
- [3] "Nanomaterials for light management and solar energy harvesting"
2015 Energy Materials Nanotechnology Summer meeting (Cancun, Mexico, Jun 10, 2015)
- [4] "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"
- [5] "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"
- [6] "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.)
- [7] "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>
- [8] "Monolithic Ge laser and active integrated photonics on Si"
2013 Institute of Electronics, Information, and Communication Engineers (IEICE) General Conference (Mar. 19, Gifu, Japan)
- [9] "Light up the way of energy sustainability"
Physics and Engineering Seminar, University of Massachusetts (Boston, Mar 6, 2013)
- [10] "*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)
- [11] "*Nanostructured Photonic Thin Films for Sustainable Energy*"
2012 SPIE Optical and Photonics Conference (Aug. 14 2012, San Diego, CA)
- [12] "*Ge Laser and On-chip Electronic-photonic Integration*"
2012 (17th) Opto-Electronic Communication Conference (OECC) (Jul. 2 2012, Busan, South Korea.)
- [13] "*Monolithic Active Silicon Photonics*"
2011 (4th) International Symposium on Atomically Controlled Fabrication Technology (Nov. 2, 2011, Osaka, Japan)
- [14] "*Ge-on-Si Optoelectronics*"
2011 (7th) International Conference on Si Epitaxy and Heterostructures (Aug. 31, 2011, Leuven, Belgium)
- [15] "Optically pumped Ge-on-Si Gain Media: Lasing and Broader Impact"
2011 MIT Microphotonics Center Fall Meeting (Oct. 11, Cambridge, MA)
- [16] "*Nanophotonics for Sustainable Energy*"
2011 XXX (30th) General Assembly and Scientific Symposium of International Union of Radio Science (URSI) (Aug. 18, 2011, Istanbul, Turkey)
- [17] "*Ge-on-Si Laser for Silicon Photonics*"
2011 European Conference on Lasers and Electro-Optics (E-CLEO) (May 25, 2011, Munich, Germany)
- [18] "*Monolithic Active Ge-on-Si Photonic Devices*"
2011 European Material Research Society (E-MRS) Spring Meeting (May 10, 2011, Nice, France)
- [19] "*Band-Engineered Ge-on-Si Lasers: Towards Electronic-Photonic Synergy*"
2010 International Electron Device Meeting (IEDM) (Dec. 6, 2010, San Francisco, USA)
- [20] "*Ge-on-Si Integrated Photonics: New Tricks from an Old Semiconductor*"
2010 (23rd) IEEE Photonics Society Annual Meeting (Nov. 9 2010, Denver, USA)
- [21] "*Monolithic Ge-on-Si Lasers*"
Frontiers in Optics, 2010 (94th) Annual Meeting of Optical Society of America (Oct. 25, 2010, Rochester, USA)
- [22] "*Band-Engineered Ge-on-Si Lasers for Integrated Photonics*"
218th Electrochemical Society Meeting (Oct. 13 2010, Las Vegas, USA)
- [23] "*Monolithic Ge-on-Si Lasers for Integrated Photonics*"
2010 IEEE International Conference on Group IV Photonics (Sept. 1 2010, Beijing, China)

- [24] “Optical Gain and Lasing from Band-Engineered Ge-on-Si”
2010 Opto-electronics Communication Conference (OECC) (July. 2010, Sapporo, Japan)
- [25] “Monolithic Ge-on-Si Lasers for Electronic-Photonic Integration”
University of Notre Dame, Solid State Seminar (Jan. 2010)
- [26] “Light up the Future of Si Microprocessors”
215th Electrochemical Society Meeting (May. 2009, San Francisco, USA)
- [27] “Integrated Photonics for THz Applications”
IEEE 802.15: Wireless Personal Area Networks Conference (Nov. 2008, Dallas, USA)
- [28] “Ge-based Active Devices for Si Photonics”
4th IEEE/LEOS International Conference on Group IV Photonics (Sept. 2007, Tokyo, Japan)
- [29] “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

- ▶ IEEE Senior Member
- ▶ Member, MRS, OSA, ECS, and ASEE.

Selected Awards and Honors

- ▶ **IEEE Senior Member** (since Sep. 2015. <9% of IEEE members)
- ▶ **Listed in Who's Who in Engineering Academia** (since 2014, in Materials Science and Engineering)
- ▶ **Excellence in Teaching Award, Thayer School of Engineering, Dartmouth College** (2014)
- ▶ **National Science Foundation (NSF) CAREER Award** (2013)
- ▶ **“2012 Highlights” Certificate from Semiconductor Science and Technology, Institute of Physics (IOP) Publishing, UK.**
- ▶ **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>

Cited >6,000 times (h-index 32)

Web of Science: Excluding self-citations, the journal papers have been cited **>3,300 times (h-index 27)** by Dec. 2015. **Five(5)** journal papers have been identified as **“highly cited papers”**. According to Web of Science, a highly cited paper “received enough citations to place it in the **top 1% of its academic field** based on a highly cited threshold for the field and publication year.”

For Web of Science Search, please use Author: “(Liu JF or Liu J) and (Kimerling or Feng JY or Wang XX or Michel J) not (Liu JL or Chat*)” and Address: (Dartmouth or MIT or Tsing Hua)

*=Correspondence Author

A. JOURNAL PAPERS:

- [1] Xiaobai Yu, Xiaoxin Wang, Juchuan Li, and **Jifeng Liu***
“Interfacial Engineering of Solution-Processed Ni Nanochain/SiO_x (x<2) Cermets towards Thermodynamically Stable, Anti-oxidation Solar Selective Absorbers”,
Accepted and to be published in **Journal of Applied Physics**
- [2] Haofeng Li, Xiaoxin Wang, and **Jifeng Liu***
“Highly effective strain-induced band-engineering of (111) oriented, direct-gap GeSn crystallized on amorphous SiO₂ layers”
Applied Physics Letters **108**, 102101 (2016)
<http://scitation.aip.org/content/aip/journal/apl/108/10/10.1063/1.4943192>
- [3] Xuejun Xu, Xiaoxin Wang, Keisuke Nishida, Koki Takabayashi, Kentarou Sawano, Yasuhiro Shiraki, Haofeng Li, **Jifeng Liu**, and Takuya Maruizumi,
“Ultra-large transient optical gain from tensile-strained, n-doped germanium on silicon by spin-on dopant diffusion”
Applied Physics Express **8**, 092101 (2015)
<http://iopscience.iop.org/article/10.7567/APEX.8.092101/meta>
(Liu’s group provided optical gain measurement and analyses.)
- [4] Xiaoxin Wang, Andrew Wang, Stephanie Malek, Yan Cai, and **Jifeng Liu***
“High-performance infrared light trapping in nano-needle structured p+ SnO_x (x≤1)/thin film n-Ge photodiodes on Si”,
Optics Letters **40**(11), 2603-2606 (2015)
<https://www.osapublishing.org/ol/abstract.cfm?uri=ol-40-11-2603>
- [5] Hongtao Lin, Xiaochen Sun, **Jifeng Liu**, and Juejun Hu,
“Diffractive broadband coupling into high-Q resonant cavities”,
Optics Letters **40**(10), 2377-2380 (2015)
<https://www.osapublishing.org/ol/abstract.cfm?uri=ol-40-10-2377>
- [6] Andrew Wong, Xiaoxin Wang, and **Jifeng Liu***,
“Nano-needle structured, ambipolar high electrical conductivity SnO_x (x≤1) thin films for infrared optoelectronics”,
Journal of Applied Physics **117**(10), 103109 (2015)
<http://scitation.aip.org/content/aip/journal/jap/117/10/10.1063/1.4914910>
- [7] Haofeng Li, Jeremy Brouillet, Xiaoxin Wang and **Jifeng Liu***
“Pseudo single crystal, direct-band-gap Ge_{0.89}Sn_{0.11} on amorphous dielectric layers towards monolithic 3D photonic integration”,
Applied Physics Letters **105**, 201107 (2014)
<http://scitation.aip.org/content/aip/journal/apl/105/20/10.1063/1.4902349>
- [8] Zhiyuan Wang, Xiaoxin Wang and **Jifeng Liu***,
“Design of nanophotonic, hot-electron solar-blind ultraviolet detectors with a metal-oxide-semiconductor structure”,
Journal of Optics **16**(12), 125010 (2014) <http://iopscience.iop.org/2040-8986/16/12/125010>
- [9] Xiaobai Yu, Xiaoxin Wang, Qinglin Zhang, Juchuan Li, and **Jifeng Liu***
“Oxidation-resistant, solution-processed plasmonic Ni nanochain-SiO_x (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>
- [10] **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>
- [11] 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)
- [12] 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>
- [13] 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>
- [14] 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
- [15] 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>
- [16] X. X. Wang, H. Li, X. Yu, X. Shi, and **J. F. Liu***
“High-performance solution-processed plasmonic Ni nanochain-Al₂O₃ selective solar thermal absorbers”
Applied Physics Letters **101**, 203109 (2012)
http://apl.aip.org/resource/1/applab/v101/i20/p203109_s1
- [17] **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, Editors’ Highlight of 2012**)
<http://iopscience.iop.org/0268-1242/27/9/094006>
- [18] **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>
- [19] 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>
- [20] 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
- [21] 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>
- [22] 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
- [23] 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>
- [24] 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>

- [25] **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) **(the most cited paper published in Optics Letters in the last 7 years)**
<http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-35-5-679>
- [26] 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>
- [27] **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>
- [28] 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
- [29] **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>
- [30] X. C. Sun, **J. F. Liu**, L. C. Kimerling and J. Michel
"Room-temperature direct bandgap electroluminescence from Ge-on-Si light-emitting diodes"
Optics Letters 34, 1198 (2009)
<http://www.opticsinfobase.org/ol/abstract.cfm?uri=ol-34-8-1198>
- [31] **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>
- [32] L. Zeng, P. Bermel, Y. Yi, B. A. Alamariu, K. A. Broderick, **J. Liu**, C. Hong, X. Duan, J. Joannopoulos, and Lionel C. Kimerling
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