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State University of New York - Stony Brook University
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Appointments

Assistant Professor, SUNY, Stony Brook University	<i>Jan. 2015 - present</i>
Adjunct Assistant Professor, SUNY, Stony Brook University	<i>June 2014 - Jan. 2015</i>
Postdoc Researcher, University of California, San Diego	<i>July 2012 - Dec 2014</i>
Graduate Student Researcher, Boston University, Boston	<i>Sep. 2006 - May 2012</i>
Undergraduate Student Researcher, Fudan University, Shanghai	<i>Sep. 2002 - July 2006</i>

Professional Preparation

Boston University, Physics Department, Boston	Ph.D.	<i>May 2012</i>
Fudan University, Department of Physics, Shanghai, China	B.S.	<i>July 2006</i>

Research Interests & Skills

- Strongly correlated electron materials
 - Metamaterials & Plasmonics
 - Broadband infrared near-field microscopy and spectroscopy
 - Ultrafast IR-THz spectroscopy
 - IR-vis-UV ellipsometry
 - Nonlinear optics and Ultrafast phenomena
 - 2D material based nanotechnology
 - Micro-/Nano photonic device fabrication and characterization
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Journal Articles (total 54)

(* as corresponding author)

[1] Nano-resolved current-induced insulator-metal transition in the Mott insulator Ca_2RuO_4

Jiawei Zhang, Alexander. S. McLeod, Qiang Han, Xinzhong Chen, Hans A. Bechtel, Ziheng Yao, S. N. Gilbert Corder, Thomas Ciavatti, Hu (Tiger) Tao, Meigan Aronson, G. L. Carr, Michael C. Martin, Chanchal Sow, Shingo Yonezawa, Fumihiko Nakamura, Ichiro Terasaki, D. N. Basov, Andrew J. Millis*, Yoshiteru Maeno*, Mengkun Liu*, *Physical Review X*, accepted (2019)

[2] Modern Scattering-Type Scanning Near-field Optical Microscope for Advanced Material Research

Xinzhong Chen, Debo Hu, Ryan Mescall, Guanjuan You, D. N. Basov*, Qing Dai*, Mengkun Liu*, *Advanced Materials*, accepted (2019)

[3] Terahertz Nano-imaging of Graphene

Jiawei Zhang, Xinzhong Chen (co-first author), Scott Mills, Thomas Ciavatti, Ziheng Yao, Ryan Mescall, Hai Hu, Vyacheslav Semenenko, Zhe Fei, Hua, Li, Vasili Perebeinos, Hu Tao, Qing Dai, Xu, Du, Mengkun Liu*, *ACS Photonics* **5**, 2645-2651 (2018)

[4] Ultrafast THz Field Control of Electronic and Structural Interactions in Vanadium Dioxide

A. X. Gray, M. C. Hoffmann, J. Jeong, N. P. Aetukuri, D. Zhu, H. Y. Hwang, N. C. Brandt, H. Wen, A. J. Sternbach, S. Bonetti, A. H. Reid, R. Kukreja, C. Graves, T. Wang, P. Granitzka, Z. Chen, D. J. Higley, T. Chase, E. Jal, E. Abreu, M. K. Liu, T.-C. Weng, D. Sokaras, D. Nordlund, M. Chollet, R. Alonso-Mori, H. Lemke, J. M. Glowacki, M. Trigo, Y. Zhu, H. Ohldag, J. W. Freeland, M. G. Samant, J. Berakdar, R. D. Averitt, K. A. Nelson, S. S. P. Parkin, H. A. Dürr, *Phys. Rev. B*, **98**, 045104 (2018).

[5] Broadband terahertz generation via the interface inverse Rashba-Edelstein effect

C. Zhou, Y. P. Liu, Z. Wang, S. J. Ma, M. W. Jia, R. Q. Wu, L. Zhou, W. Zhang, M. K. Liu, Y. Z. Wu, J. Qi, *Phys. Rev. Lett.* **121**, 086801 (2018).

[6] Anomalous Nanoscale Opto-Acoustic Phonon Mixing in Nematic Mesogens

Dima Bolmatov, Dmytro Soloviov, Dmitry Zav'yalov, Lewis Sharpnack, Deña, M. Agra-Kooijman, Satyendra Kumar, Jiawei Zhang, Mengkun Liu, and John Katsaras, *The Journal of Physical Chemistry Letters* **9**, 2546-2553 (2018).

[7] Protein Bricks: 2D & 3D bio-nanostructures with shape and function on demand

Jianjuan Jiang, Shaoqing Zhang, Zhigang Qian, Nan Qin, Wenwen Song, Long Sun, Zhitao Zhou, Zhifeng Shi, Liang Chen, Xinxin Li, Ying Mao, David L. Kaplan, Stephanie N. Gilbert Corder, Xinzhong Chen, Mengkun Liu, Fiorenzo G. Omenetto, Xiaoxia Xia, Tiger H. Tao, *Advanced Materials* **30**, 1705919 (2018).

[8] Multi-color terahertz imaging with hyperspectral metamaterial focal plane arrays

Zhitao Zhou, Tao Zhou, Shaoqing Zhang, Zhifeng Shi, Ying Chen, Wenjian Wan, Xinxin Li, Xinzhong Chen, Stephanie N. Gilbert Corder, Liang Chen, Ying Mao, Juncheng Cao, Fiorenzo G. Omenetto, Mengkun Liu, Hua Li, Tiger H. Tao, *Advanced Science* **5**, 1700982 (2018).

[9] Scattering of electromagnetic waves from a cone with conformal mapping: Application to scanning near-field optical microscope

S. T. (Tat) Chui, Xinzhong Chen, Mengkun Liu, Zhifang Lin, Jian Zi, *PRB rapid communications*, **97**, 081406(R) (2018).

[10] 3D local manipulation of the metal-insulator transition behavior in VO₂ thin film by defect-induced lattice engineering

Qi Jia, Jörg Grenzer, Huabing He, Wolfgang Anwand, Yanda Ji, Ye Yuan, Kai Huang, Tianguai You, Wenjie Yu, Wei Ren, Xinzhong Chen, Mengkun Liu, Stefan Facsko, Xi Wang and Xin Ou, *Advanced Materials Interfaces* **5**, 1701268 (2018).

[11] Near-field spectroscopic investigation of dual-band heavy fermion metamaterials

Stephanie N. Gilbert Corder, Xinzhong Chen, Shaoqing Zhang, Fengrui Hu, Jiawei Zhang, Yilong Luan, Jack A. Logan, Thomas Ciavatti, Hans A. Bechtel, Michael C. Martin, Meigan Aronson, Hiroyuki S. Suzuki, Shin-ichi Kimura, Takuya Iizuka, Zhe Fei, Keiichiro Imura, Noriaki K. Sato, Tiger H. Tao, and Mengkun Liu*, *Nature Communications*, **8**, 2262 (2017).

[12] Rigorous numerical modeling of scattering-type scanning near-field optical microscopy and spectroscopy

Xinzhong Chen, Chiu Fan Bowen Lo, William Zheng, Hai Hu, Qing Dai*, Mengkun Liu*, *Applied Physics Letters*. **111**, 223110 (2017).

[13] Nanoscale electrodynamics of strongly correlated quantum materials

M. K. Liu*, A. J. Sternbach, D. N. Basov*, Review Article, *Reports on Progress in Physics* **80**, 014501 (2017)

[14] Probing optical anisotropy of nanometer-thin van der Waals microcrystals by near-field imaging

Debo Hu, Xiaoxia Yang, Chi Li, Ruina Liu, Ziheng Yao, Hai Hu, Stephanie N. Gilbert Corder, Jianing Chen, Zhipei Sun, Mengkun Liu*, Qing Dai*, *Nature Communications* **8**, 1471 (2017)

[15] Controlling phase separation in vanadium dioxide thin films via substrate engineering

Stephanie N. Gilbert Corder, Jianjuan Jiang, Xinzhong Chen, Salinporn Kittiwatanakul, I-Cheng Tung, Yi Zhu, Jiawei Zhang, Hans A. Bechtel, Michael C. Martin, G. Lawrence Carr, Jiwei Lu, Stuart A. Wolf, Haidan Wen*, Tiger Hu Tao*, Mengkun Liu*, *Phys. Rev. B (Rapid Communication)*, **96**, 161110(R) (2017).

[16] Ultrafast Electron-Lattice Coupling Dynamics in VO₂ and V₂O₃ Thin Films

Elsa Abreu, Stephanie N. Gilbert Corder, Sun Jin Yun, Siming Wang, Juan Gabriel Ramirez, Kevin West, Jingdi Zhang, Salinporn Kittiwatanakul, Ivan K. Schuller, Jiwei Lu, Stuart A. Wolf, Hyun-Tak Kim, Mengkun Liu*, and Richard D. Averitt*, *Phys. Rev. B* **96**, 094309 (2017).

[17] Artifact free transient near-field Nanoscopy

A. J. Sternbach, J. Hinton, T. Slusar, A. S. Mcleod, M. K. Liu, A. Frenzel, M. Wagner, R. Iraheta, F. Keilmann, A. Leitenstorfer, M. Fogler, H.-T. Kim, R. D. Averitt, and D. N. Basov, *Optics Express* **25**, 28589 (2017)

[18] Nanotextured phase coexistence in the correlated insulator V₂O₃

A. S. McLeod, E. van Heumen, J. G. Ramirez, S. Wang, T. Saerbeck, S. Guenon, M. Goldflam, L. Anderegg, P. Kelly, A. Mueller, M. K. Liu, Ivan K. Schuller, D. N. Basov, *Nature Physics* **13**, 80–86 (2017).

[19] Nanoscale probing of electron-regulated structural transitions in silk proteins by near-field IR imaging and nano-spectroscopy

Nan Qin, Shaoqing Zhang, Jianjuan Jiang, Stephanie Gilbert Corder, Zhi-Gang Qian, Zhitao Zhou, Woonsoo Lee, Keyin Liu, Xiaohan Wang, Xinxin Li, Zhifeng Shi, Ying Mao, Hans Bechtel, Michael Martin, Xiaoxia Xia, Benedetto Marelli, David Kaplan, Fiorenzo Omenetto*, Mengkun Liu*, Tiger Tao*, *Nature Communications* **7**, 13079 (2016)

[20] The Use of functionalized silk fibroin films as a platform for optical diffraction-based sensing applications

Z. Zhou, Z. Shi, X. Cai, S. Zhang, S. G. Corder, X. Li, Y. Zhang, G. Zhang, L. Chen, Mengkun Liu, D. Kaplan, F. Omenetto, Y. Mao, Z. Tao, T. H. Tao, *Advanced Materials*, published online (2017) DOI: 10.1002/adma.201605471

[21] Precise Protein Photolithography (P3): High Performance Biopatterning Using Silk Fibroin Light Chain as the Resist

Wanpeng Liu, Zhitao Zhou, Shaoqing Zhang, Zhifeng Shi, Justin Tabarini, Woonsoo Lee, Yeshun Zhang, S. N. Gilbert Corder, Xinxin Li, Fei Dong, Liang Cheng, Mengkun Liu, David L. Kaplan, Fiorenzo G. Omenetto, Guozheng Zhang, Ying Mao, Tiger H. Tao, *Advanced Science* **4**, 1700191 (2017)

[22] Efficiency of launching highly confined polaritons by infrared light incident on a hyperbolic material

S. Dai, Q. Ma, Y. Yang, J. Rosenfeld, M. D. Goldflam, A. McLeod, Z. Sun, T. I Andersen, Z. Fei, M. K. Liu, Y. Shao, K. Watanabe, T. Taniguchi, M. Thiemens, F. Keilmann, P. Jarillo-Herrero, M. M. Fogler, D. N. Basov. *Nano Letters*, ASAP (2017)

[23] An ultrafast plasmonic tuning knob

Martin Wagner*, Mengkun Liu*, *Nature Photonics* **10**, 210–211 (2016)

Prior to Stony Brook University (2006-2016):

[24] Cooperative photoinduced metastable phase control in strained manganite films

J. Zhang, X. Tan, M. K. Liu, S. W. Teitelbaum, K.W. Post, Feng Jin, K. A. Nelson, D. N. Basov, W. Wu, R.D. Averitt, *Nature Materials* **15**, 956 (2016).

[25] Ultrafast optical switching of infrared plasmon polaritons in high-mobility graphene

G. X. Ni, L. Wang, M. D. Goldflam, M. Wagner, Z. Fei, A. S. McLeod, M. K. Liu, F. Keilmann, B. Özyilmaz, A. H. Castro-Neto, J. Hone, M. M. Fogler, D. N. Basov, *Nature photonics*, **10**, 244–247 (2016)

[26] Sum-rule constraints on the surface state conductance of topological insulators

K. W. Post, B. C. Chapler, M. K. Liu, J. S. Wu, H. T. Stinson, M. D. Goldflam, A. R. Richardella, J. S. Lee, A. A. Reijnders, K. S. Burch, M. M. Fogler, N. Samarth, and D. N. Basov, *Phys. Rev. Lett.* **115**, 116804 (2015)

[27] Active optical metasurfaces based on defect-engineered phase-transition materials

J. Rensberg, S. Zhang, Y. Zhou, A. S. McLeod, C. Schwarz, M. Goldflam, M. K. Liu, J. Kerbusch, R. Nawrodt, S. Ramanathan, D. N Basov, F. Capasso, C. Ronning, M. Kats, *Nano Lett.* **16**, 1050 (2016)

[28] Phase transition in bulk single crystals and thin films of VO₂ by nanoscale infrared spectroscopy and imaging

Mengkun Liu*, Aaron J. Sternbach, Martin Wagner, Tetiana V. Slusar, Tai Kong, Sergey L. Bud'ko, Salinporn Kittiwatanakul, M. M. Qazilbash, Alexander McLeod, Zhe Fei, Elsa Abreu, Jingdi Zhang, Michael Goldflam, Siyuan Dai, Guang-Xin Ni, Jiwei Lu, Hans A. Bechtel, Michael C. Martin, Markus B. Raschke, Richard D. Averitt, Stuart A. Wolf, Hyun-Tak Kim, Paul C. Canfield, and D. N. Basov, *Phys. Rev. B.* **91**, 245155 (2015) (Editors' suggestion!)

[29] Edge and surface plasmons in graphene nanoribbons

Z. Fei, M. D. Goldflam, J.-S. Wu, S. Dai, M. Wagner, A. S. McLeod, M. K. Liu, K. W. Post, S. Zhu, G.C.A.M. Janssen, M. M. Fogler, D. N. Basov, *Nano Lett.* **15**, 8271 (2015)

[30] Dynamic conductivity scaling in photoexcited V₂O₃ thin films

Elsa Abreu, Siming Wang, Gabriel Ramirez, Mengkun Liu, Jingdi Zhang, Kun Geng, Ivan K. Schuller, and Richard D. Averitt, *Phys. Rev. B* **92**, 085130 (2015)

[31] Tunneling plasmonics in bilayer graphene

Z. Fei, E. G. Iwinski, G. X. Ni, L. M. Zhang, W. Bao, A. S. Rodin, Y. Lee, M. Wagner, **M. K. Liu**, S. Dai, M. D. Goldflam, M. Thiemens, F. Keilmann, C. N. Lau, A. H. Castro-Neto, M. M. Fogler, and D. N. Basov, *Nano Letters* **15**, 4973 (2015)

[32] Graphene on hexagonal boron nitride as a tunable hyperbolic metamaterial

Siyuan Dai, Qiong Ma, **Mengkun Liu**, Trond Andersen, Zhe Fei, Michael Goldflam, Martin Wagner, Kenji Watanabe, Takashi Taniguchi, Mark Thiemens, Fritz Keilmann, G. C. A. M. Janssen, Shou-En Zhu, Pablo Jarillo-Herrero, Michael Fogler, and Dimitri Basov, *Nature Nanotechnology* **10**, 682–686 (2015).

[33] Subdiffractive focusing and guiding of polaritonic rays in a natural hyperbolic material

Siyuan Dai, Qiong Ma, Trond Andersen, Alexander McLeod, Zhe Fei, **Mengkun Liu**, Martin Wagner, Kenji Watanabe, Takashi Taniguchi, Mark Thiemens, Fritz Keilmann, Pablo Jarillo-Herrero, Michael Fogler, and Dimitri Basov, *Nature Communication* **6**:6963 (2015).

[34] Voltage switching of a VO₂ memory metasurface using ionic gel

M.D. Goldflam**, **M. K. Liu****, B. C. Chapler, H. T. Stinson, A. J. Sternbach, A.S. McLeod, J. D. Zhang, K. Geng, M. Royal, Bong-Jun Kim, R. D. Averitt, N. M. Jokerst, D. R. Smith, H-T. Kim, D. N. Basov, *Appl. Phys. Lett.* **105**, 041117 (2014) (**contributed equally)

[35] Ultrafast dynamics of surface plasmons in InAs by time-resolved infrared nanospectroscopy

Martin Wagner, Alexander S. McLeod, Scott J. Maddox, Zhe Fei, **Mengkun Liu**, Richard D. Averitt, Michael M. Fogler, Seth R. Bank, Fritz Keilmann, and D. N. Basov, *Nanolett.* **14**, 4529 (2014)

[36] Tunable phonon polaritons in atomically thin van der Waals crystals of boron nitride

S. Dai, Z. Fei, Q. Ma, A. S. Rodin, M. Wagner, A. S. McLeod, **M. K. Liu**, W. Gannett, W. Regan, K. Watanabe, T. Taniguchi, M. Thiemens, G. Dominguez, A. H. Castro Neto, A. Zettl, F. Keilmann, P. Jarillo-Herrero, M. M. Fogler, D. N. Basov, *Science* **343**, 1125 (2014)

[37] Symmetry breaking and geometric confinement in VO₂: results from a three dimensional infrared nano-imaging

Mengkun Liu, Martin Wagner, Jingdi Zhang, Alexander McLeod, Salinporn Kittiwatanakul, Zhe Fei, Elsa Abreu, Michael Goldflam, Aaron J. Sternbach, Siyuan Dai, Kevin G. West, Michael M. Fogler, Jiwei Lu, Stuart A. Wolf, Richard D. Averitt, D. N. Basov, *Appl. Phys. Lett.*, **104**, 121905 (2014).

[38] A review of nonlinear terahertz spectroscopy with ultrashort tabletop pulses

Harold Y. Hwang, Sharly Fleischer, Nathaniel C. Brandt, Bradford G. Perkins, Matthias C. Hoffmann, **Mengkun Liu**, Kebin Fan, Aaron Sternbach, Xin Zhang, Richard D. Averitt, Keith A. Nelson, *Journal of Modern Optics*, DOI:10.1080/09500340.2014.918200 (2014).

[39] Ultrafast and nanoscale plasmonic phenomena in exfoliated graphene revealed by infrared pump-probe nanoscopy

Martin Wagner, Zhe Fei, Alexander S. McLeod, Aleksandr S. Rodin, Wenzhong Bao, Eric G. Iwinski, Zeng Zhao, Michael Goldflam, **Mengkun Liu**, Gerardo Dominguez, Mark Thiemens, Michael M. Fogler, Antonio H. Castro-Neto, Chun Ning Lau, Sergiu Amarie, Fritz Keilmann, and D. N. Basov, *Nano Lett.* **14** (2), 894-900 (2014).

[40] Anisotropic electronic state via spontaneous phase separation in strained Vanadium Dioxide films

Mengkun Liu, Martin Wagner, Elsa Abreu, Salinporn Kittiwatanakul, Alexander McLeod, Zhe Fei, Michael Goldflam, Siyuan Dai, Michael M. Fogler, Jiwei Lu, Stuart A. Wolf, Richard D. Averitt, D. N. Basov, *Phys. Rev. Lett.* **111** (9), 096602 (2013).

[41] Electronic and plasmonic phenomena at graphene grain boundaries

Z. Fei, A. S. Rodin, W. Gannett, S. Dai, W. Regan, M. Wagner, **M. K. Liu**, A. S. McLeod, G. Dominguez, M. Thiemens, A. H. Castro-Neto, F. Keilmann, A. Zettl, R. Hillenbrand, M. M. Fogler, D. N. Basov, *Nature Nanotechnology* **8**, 821 (2013).

[42] Nonlinear terahertz metamaterials via field-enhanced carrier dynamics in GaAs

Kebin Fan, Harold Y Hwang, **Mengkun Liu**, Andrew C Strikwerda, Aaron Sternbach, Jingdi Zhang, Xiaoguang Zhao, Xin Zhang, Keith A Nelson, Richard D Averitt, *Phys. Rev. Lett.* **110**, 217404 (2013).

[43] Terahertz-field-induced insulator-to-metal transition in vanadium dioxide metamaterial

Mengkun Liu**, Harold Y. Hwang**, Hu Tao, Andrew C. Strikwerda, Kebin Fan, George R. Keiser, Aaron J. Sternbach, Kevin G. West, Salinporn Kittiwatanakul, Jiwei Lu, Stuart A. Wolf, Fiorenzo G. Omenetto, Xin Zhang, Keith A. Nelson, Richard D. Averitt *Nature*, **487**, 345–348 (2012). (** contributed equally)

[44] THz spectroscopy of VO₂ epitaxial films: controlling the anisotropic properties through strain engineering

Elsa Abreu**, **Mengkun Liu****, Jiwei Lu*, Kevin West, Salinporn Kittiwatanakul, Wenjing Yin, Stuart A Wolf and Richard D Averitt, *New Journal of Physics*, **14**(8),083026 (2012). (** contributed equally)

[45] Silk-based conformal, adhesive, edible food sensors

Hu Tao, Mark A. Brenckle, Miaomiao Yang, Jingdi Zhang, **Mengkun Liu**, Sean M. Siebert, Richard D. Averitt, Manu S. Mannoor, Michael C. McAlpine, John A. Rogers, David L. Kaplan, Fiorenzo G. Omenetto, *Advanced Materials* **24** (8), 993(2012).

[46] Evidence of a hidden-order pseudogap state in URu₂Si₂ using ultrafast optical spectroscopy

M. K. Liu, R. D. Averitt, T. Durakiewicz, P. H. Tobash, E. D. Bauer, S. A. Trugman, A. J. Taylor, and D. A. Yarotski, *Phys. Rev. B, Rapid Communications*, **84**, 161101(R) (2011).

[47] Photoinduced phase transitions by time-resolved far-infrared spectroscopy in V₂O₃

M. K. Liu, B. Pardo, J. Zhang, M. M. Qazilbash, Sun Jin Yun, Y. Fei, Junhwan Shin, Hyun-Tak Kim, D. N. Basov, and R. D. Averitt, *Phys. Rev. Lett.* **107**, 066403 (2011).

[48] Metamaterials on paper as a sensing platform.

Tao, H., Chieffo, L., Brenckle, M. A., Siebert, S. M., **Liu, M.**, Strikwerda, A. C., Fan, K., Kaplan, D. L., Zhang, X., Averitt, R. D. and Omenetto, F. G., *Advanced Materials* **23**, 3197 (2011).

[49] Biaxial strain in graphene adhered to shallow depressions

C. Metzger, S. Remi, **M. K. Liu**, S. Kusminskiy, A. Castro Neto, A. Swan and B. Goldberg, *Nano Lett.* **10** (1), pp 6–10, (2010).

[50] Rapid transfer-based micropatterning and dry etching of silk microstructures

Konstantinos Tsioris, Hu Tao, **Mengkun Liu**, Jeffrey A. Hopwood, David L. Kaplan, Richard

D. Averitt, Fiorenzo G. Omenetto, *Advanced Materials* **23**: 2015–2019, (2010).

[51] Performance enhancement of terahertz metamaterials on ultrathin substrates for sensing applications

Hu Tao, Andrew C. Strikwerda, Mengkun Liu, Jessica P. Mondia, Evren Ekmekci, Kebin Fan, David L. Kaplan, Willie J. Padilla, Xin Zhang, Richard D. Averitt, and Fiorenzo G. Omenetto, *Appl. Phys. Lett.* **97**, 261909 (2010).

[52] Origin of the reduced attracting force between a rotating dielectric particle and a stationary one

Tian, W. J.; Liu, M. K.; Huang, J. P., *Phys. Rev. E* **75**, 021401 (2007).

[53] Radiation torque on a spherical birefringent particle in the long wave length limit: analytical calculation

Nian Ji, Mengkun Liu, Jihao Zhou, Zhifang Lin, and S. T. Chui *Opt. Express* **13**, 5192 (2005).

[54] Radiation torque on a birefringent sphere caused by an electromagnetic wave

Mengkun Liu, Nian Ji, Zhifang Lin, and S. T. Chui *Phys. Rev. E* **72**, 056610 (2005).

Papers in preparation:

[1] THz pump-THz probe Cooper pair dynamics in MgB₂ [SBU]

Jingdi Zhang, Mengkun Liu et al.

[2] Electric-Field Induced Intermediate State and Electronic Pattern Formation in Single Crystal Ca₂RuO₄ Revealed by Infrared Nano-Imaging and Nano-Spectroscopy [SBU] (in preparation)

Jiawei Zhang, M. K. Liu* et al.

[3] The formation of Local Inhomogeneity in Strained Correlated Metal Oxide Thin Films – a Semiquantitative Infrared Near-Field Analysis [SBU]

Jiawei Zhang, M. K. Liu* et al.

Presentations (invited)

[1] Explore Mesoscopic Physics in Strongly correlated Electron Materials with IR near-field Microscopy and Spectroscopy

Mengkun Liu University of Delaware, condensed matter seminar, April 11th 2017 [SBU]

[2] Explore Mesoscopic Physics in Strongly correlated Electron Materials with IR near-field Microscopy and Spectroscopy

Mengkun Liu BNL, Physics Department seminar, March 30th 2017 [SBU]

[3] Explore Mesoscopic Physics in Strongly correlated Electron Materials with Advanced Optical Spectroscopy

Mengkun Liu Iowa State University, Physics Department colloquium Feb 20th 2017 [SBU]

[4] Near-field optics of correlated electron materials

Mengkun Liu Stony Brook University, condensed matter seminar Feb 10th 2017 [SBU]

[5] Near-field investigation of phase change materials at nanoscale using synchrotron source [SBU]

Mengkun Liu ALS Users' meeting (Frontiers of Synchrotron Infrared Science - Nano-spectroscopy and Imaging) Oct. 4, 2016

[6] **Infrared near-field investigation of complex materials using synchrotron sources**
[SBU]

Mengkun Liu, BNL, Dec. 2015

[7] **Infrared Near Field Study of Phase Transition Materials** [SBU]

Mengkun Liu, *Pittcon*, Mar. 2015.

[8] **Symmetry Breaking in Strained Vanadium Dioxide**

Mengkun Liu, *AVS International Symposium & Exhibition*, Nov. 2014.

[9] **Nanoscale Infrared Imaging and Spectroscopy of Phase Transition in Vanadium Dioxide**

Mengkun Liu, *Brookhaven National Laboratory, NSLS Users' meeting*, May. 2014.

[10] **Ultra-fast and Ultra-small optics of VO₂**

Mengkun Liu, *UC San Diego, Materials Meet Metamaterials Workshop*, April. 2014.

[11] **Ultrafast and Ultrasmall Spectroscopy of Phase Transition in VO₂**

Mengkun Liu, *APS March meeting*, Mar. 2014.

[12] **Infrared near-field study of stripe states in strained vanadium dioxide films**

Mengkun Liu, *SPIE*, Feb. 2014.

[13] **Nano imaging and spectroscopy of strained vanadium films**

Mengkun Liu, *Lawrence Berkeley National Laboratory, ALS Users' Meeting*, Oct. 2013.

[14] **Infrared near-field study of unidirectional phase separation in strained VO₂ films**

Mengkun Liu, *Los Alamos National Lab, CINT Users' Workshop*, Sep. 2013.

[15] **Large Strain-Induced Conductivity Anisotropy in VO₂ Thin Films, Probed by THz Spectroscopy**

Mengkun Liu, E. Abreu, J. Lu, K.G. West, S. Kittiwatanakul, S. A. Wolf, R. D. Averitt

IRMMW meeting 2011, Oct. 2011.

Presentations (contributed)

[16] **A systematic infrared near field study of VO₂ single crystals and films (oral presentation)**

M. Liu et al. Optical Terahertz Science & Technology Conference (OTST), March 2015

[17] **T_c anisotropy and phase separation in strained Vanadium Dioxide films (oral presentation)**

Mengkun Liu, Martin Wagner, Elsa Abreu, Salinporn Kittiwatanakul, Alexander Mcleod, Michael Goldflam, Zhe Fei, Siyuan Dai, Michael Fogler, Jiwei Lu, Stuart Wolf, Richard Averitt, D N Basov

APS March meeting 2013, March, 2013

[18] **THz induced insulator to metal transition in VO₂ metamaterial (oral presentation)**

Mengkun Liu, Harold Hwang, Hu Tao, Andrew Strikwerda, George Keiser, Aaron Sternbach, Kevin West, Salinporn Kittiwatanakul, Jiwei Lu, Stuart Wolf, Fiorenzo Omenetto, Xin Zhang, Keith Nelson, Richard Averitt

APS March meeting 2012, March, 2012

[19] **Ultrafast THz spectroscopy on V₂O₃ and GaAs nonlinear metamaterials (poster)**

Mengkun Liu, H. Harold, K. Fan, B. Pardo, J. Zhang, M. M. Qazilbash, Andrew C. Strikwerda, Aaron Sternbach, Sun Jin Yun, Z. Fei, Jun-Hwan Shin, Hyun-Tak Kim, D. N. Basov, Keith Nelson and R. D. Averitt

Gordon Research Conference, Ultrafast Phenomena, Feb, 2012

[20] Giant Conductivity Anisotropy in Metallic State of VO₂ (oral presentation)

Mengkun Liu, E. Abreu, J. Lu, K.G. West, S. A. Wolf, R. D. Averitt

CLEO/QELS meeting 2011, May, 2011

[21] Ultrafast quasiparticle dynamics in the hidden order state of URu₂Si₂ (poster)

Liu, Mengkun; Yarotski, Dzmitry; Durakiewicz, Tomasz; Trugman, Stuart; Averitt, Richard; Taylor, Antoinette

APS March meeting 2011, March, 2011

[22] Conductivity Dynamics in the Correlated Metallic state of V₂O₃ (poster)

Mengkun Liu, B. Pardo, M.M. Qazilbash, S. J. Yun, B.G. Chae, B. J. Kim, D. N. Basov, R. D. Averitt,

17th International Conference on Ultrafast Phenomena (UP), July, 2010

[23] Conductivity Dynamics in the Correlated Metallic State of V₂O₃ (oral presentation)

Mengkun Liu, B. Pardo, M.M. Qazilbash, J. Zhang, S. J. Yun, B.G. Chae, B. J. Kim, D. N. Basov, R. D. Averitt,

CLEO/IQEC meeting 2009, June, 2009

[24] Conductivity Dynamics in the Correlated Metallic State of V₂O₃ (oral presentation)

Mengkun Liu, B. Pardo, M.M. Qazilbash, J. Zhang, S. J. Yun, B.G. Chae, B. J. Kim, D. N. Basov, R. D. Averitt,

APS meeting 2009, March, 2009

[25] Micro Raman studies of 1st and 2nd order Raman scattering of Graphene

S. C. Remi, C. Metzger, **M. Liu**, W. Hubbard, C. K. Thomas, A. K. Swan, and B. B. Goldberg, *APS March meeting 2008, March, 2008*

Synergistic Activities

Reviewer for Nature Communications, Physical Review Letters, Physical Review B, Nano Letters, Advanced Materials, Optics Express, Scientific Report, Applied Physics Letters, Journal of the Optical Society of America B, Journal of Applied Physics and others.

Session Chair:

APS 2015 (Session Z21: Vanadium Oxides II)

APS 2016 (Session P27: VO₂: Experiment and Theory)

Awards

Seaborg Institute Research Fellowships (Los Alamos National Lab)

(2010)

Patents

Detection of electromagnetic radiation using nonlinear materials

H. Y. Hwang, **M. K. Liu**, R. D. Averitt, K. A. Nelson, A. J. Sternbach, K. Fan

US Patent App. 13/933,557

Google scholar citation:

<http://scholar.google.com/citations?hl=en&user=KLrUYh8AAAAJ>

Research website:

<http://mengkun.weebly.com/>