Liangbo Liang

Research & Development Staff
Center for Nanophase Materials Sciences (CNMS)
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Education

Rensselaer Polytechnic Institute (RPI), U.S.A.	Physics	Ph.D., 2014
Wuhan University, China	Physics	B.S., 2008

Research Areas

Theoretical Condensed Matter Physics; Computational Physics; First-principles Density Functional Theory; Many-body GW Method; Quantum Materials; Nanomaterials

1. Theoretical research on diverse properties of quantum materials and nanomaterials, including their electronic, magnetic, optical, vibrational, thermal, thermoelectric, piezoelectric, photovoltaic properties, etc.
2. Developing and applying computational packages for quantum modeling of various experimental techniques, such as scanning tunneling microscopy/spectroscopy, Raman spectroscopy, photoluminescence spectroscopy, etc.
3. Close collaborations with experimentalists across the world to explain and guide experimental measurements on diverse systems ranging from molecules to nanomaterials to strongly correlated materials.

Research Projects

CNMS Theme Science: "Heterogeneities in Quantum Materials".
Wigner Fellowship Project: "Integration of Accurate Theoretical/Computational Approaches with Experimental Techniques for the Understanding of Two-Dimensional Layered Nanomaterials".

Professional Experience

Research Staff, Center for Nanophase Materials Sciences, ORNL	2018–Present
Eugene Wigner Fellow/Research Staff Associate, Center for Nanophase Materials Sciences, ORNL	2015–2018
Postdoctoral Research Associate, Department of Physics, RPI (Supervisor: Dr. Vincent Meunier)	2014–2015
Graduate Research Assistant, Department of Physics, RPI (Advisor: Dr. Vincent Meunier)	2010–2014

Professional and Synergistic Activities

Invited Talk at the Fifth Wuhan University International Forum (China)	2018
Invited Talk at the 26th International Conference on Raman Spectroscopy (South Korea)	2018
Invited Talk at Graphene Week 2017 (Greece)	2017
Invited Talk at 2017 CNMS-SNS User Meeting Workshop	2017
Program Coordinator for International Phosphorene Symposium	2015
Invited Talk at the Physics Colloquium at Rensselaer Polytechnic Institute	2013

Referee to journals: ACS Nano, Nanoscale, Carbon, Scientific Reports, Small, ACS Applied Materials & Interfaces, Nanotechnology, 2D Materials, Journal of Applied Physics, Journal of Raman Spectroscopy, etc.

Reviewer for proposals: DOE, ORNL LDRD.

Honors and Awards

CNMS Division Award: Distinguished Scientific Paper	2017
CNMS Division Award: Outstanding Scientific or Technical Contribution	2017
CNMS Division Award: Most Notable CNMS User Project	2016
Eugene Wigner Fellowship of Oak Ridge National Laboratory	2015
Outstanding Reviewer - Journal Carbon	2015
Hillard Huntington Award for Outstanding Graduate Student (for top one of the Department at RPI)	2014
Outstanding Undergraduate Student of Wuhan University	2008
First Prize of the National Scholarship (for top one of the class at Wuhan University)	2007
Samsung Scholarship (for top one of the Department at Wuhan University)	2006

Teaching and Mentoring Experience

Mentoring/Co-advising Students, Oak Ridge National Laboratory 2015-Present
(*e.g., Natalya Sheremetyeva and Andrew Cupo, Rensselaer Polytechnic Institute; Jingjie Zhang, University of Virginia; Weijun Luo, Boston University*)
Mentoring Students and Postdoctoral Researchers, Department of Physics, RPI 2013-2015
(*e.g., Pan Zhu and Daniel Massote, Rensselaer Polytechnic Institute*)

Graduate Teaching Assistant, Department of Physics, RPI 2010-2012
(*For courses "General Physics", "Statistical Mechanics", and "Computational Physics". I was responsible for teaching parts of the courses, leading discussion sessions, holding office hours, developing and grading assignments, etc.*)

Academic and Community Service

Oral Presentation at the School of Science Graduate Symposium at RPI 2013
(*disseminating research at the Physics Department to RPI community and company representatives*)
Poster Presentation at the Accepted Student Open House at RPI 2013
(*representing the Physics Department to introduce nanoscience to prospective students*)

Publications

(**64 publications in total with 3,000+ citations, h-index=27 from Google Scholar/22 from Web of Science**)

1. A. Puretzky, A. Oyedele, K. Xiao, B. Sumpter, D. Mandrus, D. Geohegan, **L. Liang***, "Anomalous interlayer vibrations in strongly coupled layered $PdSe_2$", 2D Materials, 5, 035016 (2018). [****Corresponding author***]
2. G. Nguyen, **L. Liang***, Q. Zou, M. Fu, A. Oyedele, B. Sumpter, Z. Liu, Z. Gai, K. Xiao, A. Li*, "3D imaging and manipulation of subsurface selenium vacancies in $PdSe_2$", Physical Review Letters, 121, 086101 (2018). [****Co-corresponding author***]
3. Y. Song, D. Johnson, R. Peng, D. Hensley, P. Bonnesen, **L. Liang**, J. Huang, F. Yang, F. Zhang, R. Qiao, A. Baddorf, T. Tschaplinski, N. Engle, M. Hatzell, Z. Wu, D. Cullen, H. Meyer, B. G. Sumpter, A. Rondinone, "A physical catalyst for the electrolysis of nitrogen to ammonia", Science Advances, 4, e1700336 (2018).
4. L. Webster, **L. Liang**, J. Yan, "Distinct spin-lattice and spin-phonon interactions in monolayer magnetic CrI_3", Physical Chemistry Chemical Physics, 20, 23546 (2018).
5. **L. Liang**, B. Sumpter, V. Meunier, book chapter "Raman scattering of transition metal dichalcogenides", in the book "Beyond Graphene, New Layered Nanomaterials: Theory, Experiment and Applications", Wiley-VCH Verlag, Accepted (2018).
6. A. Hoffman, M. Stanford, C. Zhang, I. Ivanov, A. Oyedele, M. Sales, S. McDonnell, M. Koehler, D. Mandrus, **L. Liang**, B. Sumpter, K. Xiao, P. Rack, "Atmospheric and Long-term Aging Effects on the Electrical Properties of Variable Thickness WSe_2 Transistors", ACS Applied Materials & Interfaces, 10, 36540 (2018).
7. D. Geohegan, A. Puretzky, A. Boulesbaa, G. Duscher, G. Eres, X. Li, **L. Liang**, M. Samani, C. Rouleau, K. Xiao, M. Yoon, book chapter "Laser Synthesis, Processing, and Spectroscopy of Atomically-Thin Two Dimensional Materials", in the book "Advances in the Application of Lasers in Materials Science", Springer Nature (2018).
8. O. Deniz, C. Sanchez, R. Jaafar, N. Kharche, **L. Liang**, V. Meunier, X. Feng, K. Muellen, R. Fasel, P. Ruffieux, "Electronic characterization of silicon intercalated chevron graphene nanoribbons on Au (111)", Chemical Communications, 54, 1619 (2018).
9. **L. Liang***, A. Puretzky, B. G. Sumpter, V. Meunier, "Interlayer bond polarizability model for stacking-dependent low-frequency Raman scattering in layered materials", Nanoscale, 9, 15340 (2017). [****Corresponding author***] [***Nanoscale HOT Article Collection***]
10. **L. Liang**, J. Zhang, B. G. Sumpter, Q. Tan, P. Tan, V. Meunier, "Low-Frequency Shear and Layer-Breathing Modes in Raman Scattering of Two-Dimensional Materials", ACS Nano, 11, 11777 (2017).
11. C. Ma, **L. Liang***, Z. Xiao, A. Puretzky, W. Lu, V. Meunier, J. Bernholc, A. Li*, "Seamless staircase electrical contact to semiconducting graphene nanoribbon", Nano Letters, 17, 6241 (2017). [****Co-corresponding author***]
12. A. Oyedele*, S. Yang*, **L. Liang***, A. Puretzky, P. Yu, P. Pudasaini, Z. Liu, C. Rouleau, B. Sumpter, M. Chisholm, W. Zhou, P. Rack, D. Geohegan, K. Xiao, "$PdSe_2$: Pentagonal Two-Dimensional Layers with High Air Stability for Electronics", Journal of the American Chemical Society, 139, 14090 (2017). [****Co-lead author***]
13. M. McGuire, J. Yan, P. Lampen-Kelley, A. May, V. Cooper, L. Lindsay, A. Puretzky, **L. Liang**, K. Santosh, E. Cakmak, S. Calder, B. Sales, "High-temperature magnetostructural transition in van der Waals-layered $\alpha-MoCl_3$", Physical Review Materials, 1 (6), 064001 (2017).
14. M. Stanford, P. Pudasaini, E. Gallmeier, N. Cross, **L. Liang**, G. Duscher, K. Xiao, D. Geohegan, B. Sumpter, P. Rack, "High Conduction Hopping Behavior Induced in Transition Metal Dichalcogenides by Percolating Defect Networks: Toward Atomically Thin Circuits", Advanced Functional Materials, 27, 1702829 (2017).
15. Y. Cao, N. Sheremetyeva, **L. Liang**, V. Meunier, M. Pan, "Anomalous vibrational modes in few layer WTe_2 revealed by polarized Raman scattering and first-principles calculations", 2D Materials, 4, 035024 (2017).

16. A. Sims, M. Jeffers, S. Talapatra, K. Mondal, S. Pokhrel, **L. Liang**, X. Zhang, A. Elias, B. G. Sumpter, V. Meunier, M. Terrones, "Hydro-deoxygenation of CO on Functionalized Carbon Nanotubes For Liquid Fuels Production", Carbon, 121, 274 (2017)
17. K. Huang, **L. Liang**, S. Chai, M. Li, Z. Wu, B. Sumpter, S. Dai, "Aminopolymer Functionalization of Boron Nitride Nanosheets for Highly Efficient Capture of Carbon Dioxide", Journal of Materials Chemistry A, 5 (2017).
18. C. Ma, Z. Xiao, H. Zhang, **L. Liang**, J. Huang, B. Sumpter, K. Hong, J. Bernholc, A. Li, "Controllable conversion of quasi-freestanding polymer chains to graphene nanoribbons", Nature Communications, 8, 14815 (2017).
19. L. Talirz, H. Söde, T. Dumslaff, S. Wang, J. Sanchez-Valencia, J. Liu, P. Shinde, C. A. Pignedoli, **L. Liang**, V. Meunier, N. C. Plumb, M. Shi, X. Feng, A. Narita, K. Müllen, R. Fasel, P. Ruffieux, "On-Surface Synthesis and Characterization of 9-Atom Wide Armchair Graphene Nanoribbons", ACS Nano, 11, 1380 (2017).
20. M. Pan*, **L. Liang***, W. Lin, S. Kim, Q. Li, J. Kong, M. Dresselhaus, V. Meunier, "Modification of the electronic properties of hexagonal boron-nitride in BN/graphene vertical heterostructures", 2D Materials, 3, 045002 (2016). [****Co-lead author***]
21. D. Massote, **L. Liang**, N. Kharche, V. Meunier, "Electronic, vibrational, Raman, and scanning tunneling microscopy signatures of two-dimensional boron nanomaterials", Physical Review B, 94, 195416 (2016).
22. J. Gao, Y. Kim, **L. Liang**, J. Idrobo, B. Sumpter, T. Lu, V. Meunier, J. Hone, N. Koratkar, "Transition Metal Substitution Doping in Synthetic Atomically-Thin Semiconductors", Advanced Materials, 28, 9735 (2016).
23. R. Peng, **L. Liang**, Z. Hood, A. Boulesbaa, A. Puretzky, A. Ievlev, J. Come, O. Ovchinnikova, H. Wang, C. Ma, M. Chi, B. G. Sumpter, Z. Wu, "In-plane heterojunctions enable multiphasic 2D MoS_2 nanosheets as efficient photocatalysts for hydrogen evolution from water reduction", ACS Catalysis, 6, 6723 (2016).
24. H. Wang, J. Bang*, Y. Sun, **L. Liang***, D. West*, V. Meunier, S. Zhang, "The role of collective motion in the ultrafast charge transfer in van der Waals heterostructures", Nature Communications, 7, 11504 (2016). [****Co-corresponding author***]
25. M. Mahjouri-Samani, **L. Liang**, A. Oyedele, Y. Kim, M. Tian, N. Cross, M. Lin, C. Rouleau, A. Puretzky, K. Xiao, M. Yoon, G. Duscher, B. G. Sumpter, D. B. Geohegan, "Tailoring Vacancies Far Beyond Intrinsic Levels Changes the Carrier Type and Optical Response in Monolayer $MoSe_{2-x}$ Crystals", Nano Letters, 16, 5213 (2016).
26. V. Iberi, **L. Liang**, A. Ievlev, M. Stanford, M. Lin, X. Li, M. Mahjouri-Samani, S. Jesse, B. G. Sumpter, S. Kalinin, D. Joy, K. Xiao, A. Belianinov, O. Ovchinnikova, "Nanoforging Single Layer $MoSe_2$ Through Defect Engineering with Focused Helium Ion Beams", Scientific Reports, 6, 30481 (2016).
27. B. Yang, H. Lin, K. Miao, P. Zhu, **L. Liang**, K. Sun, H. Zhang, J. Fan, V. Meunier, Y. Li, Q. Li, L. Chi, "Catalytic Dealkylation of Ethers to Alcohols on Metal Surfaces", Angewandte Chemie, 55, 1 (2016).
28. P. Das, G. Danda, A. Cupo, W. Parkin, **L. Liang**, N. Kharche, X. Ling, S. Huang, M. Dresselhaus,V. Meunier, M. Drndić, "Controlled sculpture of black phosphorus nanoribbons", ACS Nano, 10, 5687 (2016).
29. W. Parkin*, A. Balan*, **L. Liang***, P. Das, M. Lamparski, C. Naylor, J. Manzo, A.T. Johnson, V. Meunier, M. Drndić, "Raman Shifts in Electron-Irradiated Monolayer MoS_2", ACS Nano, 10, 4134 (2016). [****Co-lead author***]
30. A. A. Puretzky*, **L. Liang***, X. Li, K. Xiao, B. G. Sumpter, V. Meunier, D. B. Geohegan, "Twisted $MoSe_2$ Bilayers with Variable Local Stacking and Interlayer Coupling Revealed by Low-Frequency Raman Spectroscopy", ACS Nano, 10, 2736 (2016). [****Co-lead author***]
31. S. Huang*, **L. Liang***, X. Ling*, A. A. Puretzky, D. B. Geohegan, B. G. Sumpter, J. Kong, V. Meunier, M. S. Dresselhaus, "Low-Frequency Interlayer Raman Modes to Probe Interface of Twisted Bilayer MoS_2", Nano Letters, 16, 1435 (2016). [****Co-lead author***]
32. X. Ling, S. Huang, E. Hasdeo, **L. Liang**, W. Parkin, Y. Tatsumi, A. Nugraha, A. A Puretzky, P. Das, B. G. Sumpter, D. Geohegan, J. Kong, R. Saito, M. Drndić, V. Meunier, M. S. Dresselhaus, "Anisotropic Electron-Photon and Electron-Phonon Interactions in Black Phosphorus", Nano Letters, 16, 2260–2267 (2016).
33. G. Vasseur, Y. Fagot-Revurat, M. Sicot, B. Kierren, L. Moreau, D. Malterre, L. Cardenas, G. Galeotti, J. Lipton-Duffin, F. Rosei, M. Di Giovannantonio, G. Contini, P. Le Fevre, F. Bertran, **L. Liang**, V. Meunier, D.F. Perepichka, "Quasi one-Dimensional Band Dispersion and Surface Metallization In long Range Ordered Polymeric wires", Nature Communications, 7, 10235 (2016).
34. M. Lin, H. Zhuang, J. Yan, T. Ward, A. A. Puretzky, C. M. Rouleau, Z. Gai, **L. Liang**, V. Meunier, B. G. Sumpter, P. Ganesh, P. R. C. Kent, D. B. Geohegan, D. G. Mandrus, K. Xiao, "Ultrathin Nanosheets of $CrSiTe_3$: A Semiconducting Two-Dimensional Ferromagnetic Material", Journal of Materials Chemistry C, 4, 315 (2016).
35. Y. Song, R. Peng, D. Hensley, P. Bonnesen, **L. Liang**, Z. Wu, H. Meyer, M. Chi, C. Ma, B. G. Sumpter, A. Rondinone, "High-Selectivity Electrochemical Conversion of CO_2 to Ethanol using a Copper Nanoparticle/N-

Doped Graphene Electrode", ChemistrySelect, 1, 1-8 (2016).

36. J. Lin, **L. Liang**, X. Ling, N. Zhang, B. Sumpter, V. Meunier, L. Tong, J. Zhang, "Enhanced Raman Scattering on In-plane Anisotropic Layered Materials", Journal of the American Chemical Society, 137, 15511 (2015).
37. G. Bhimanapati, Z. Lin, V. Meunier, Y. Jung, S. Das, D. Xiao, Y. Son, M. Strano, **L. Liang**, S. Louie, E. Ringe, B. Sumpter, H. Terrones, F. Xia, Y. Wang, J. Zhu, D. Akinwande, N. Alem, J. Schuller, R. Schaak, M. Terrones, J. Robinson, "Recent Advances in Two-Dimensional Materials Beyond Graphene", ACS Nano, 9, 11509 (2015).
38. R. Lv, G. Chen, Q. Li, A. McCreary, A. Botello-Méndez, S. Morozov, **L. Liang**, X. Declerck, N. Perea-López, D. Cullen, S. Feng, A.Elías, R. Cruz-Silva, K. Fujisawa, M. Endo, F. Kang, J. Charlier, V. Meunier, M. Pan, A. Harutyunyan, K. Novoselov, M. Terrones, "Ultrasensitive gas detection of large-area boron-doped graphene", Proceedings of the National Academy of Sciences, 112, 14527 (2015).
39. X. Ling*, **L. Liang***, S. Huang, A. A. Puretzky, D. B. Geohegan, B. G. Sumpter, J. Kong, V. Meunier, M. S. Dresselhaus, "Low-frequency Interlayer Breathing Modes in Few-layer Black Phosphorus", Nano Letters, 15, 4080 (2015). [***Co-lead author***]
40. A. A. Puretzky, **L. Liang**, X. Li, K. Xiao, K. Wang, M. Mahjouri-Samani, L. Basile, J. Idrobo, B. G. Sumpter, V. Meunier, D. B. Geohegan, "Low-Frequency Raman Fingerprints of Two-Dimensional Metal Dichalcogenide Layer Stacking Configurations", ACS Nano, 9, 6333 (2015).
41. S. Huang, X. Ling, **L. Liang**, Y. Song, W. Fang, J. Zhang, J. Kong, V. Meunier, M. S. Dresselhaus, "Molecular Selectivity of Graphene-Enhanced Raman Scattering", Nano Letters, 15, 2892 (2015).
42. C. Daniels, A. Horning, A. Phillips, D. Massote, **L. Liang**, Z. Bullard, B. G. Sumpter, V. Meunier, "Elastic, plastic, and fracture mechanisms in graphene materials", Journal of Physics: Condensed Matter, 27 (2015).
43. A. Lherbier, **L. Liang**, J. Charlier, V. Meunier, "Charge carrier transport and separation in pristine and nitrogen-doped graphene nanowiggle heterostructures", Carbon, 95, 833 (2015).
44. **L. Liang**, P. Zhu, V. Meunier, "Electronic, structural, and substrate effect properties of single-layer covalent organic frameworks", The Journal of Chemical Physics, 142, 184708 (2015).
45. **L. Liang**, V. Meunier, "Atomically Precise Graphene Nanoribbon Heterojunctions for Excitonic Solar Cells", The Journal of Physical Chemistry C, 119, 775 (2015).
46. F. Qi, **L. Liang**, D. Zhang, X. Yu, "Sodium Controlled Synthesis of Hexagonal-Phase $NaGdF_4$: Yb, Er Nanocrystals with Enhanced Upconversion Fluorescence for Bioimaging", Nanoscience and Nanotechnology Letters, 7, 121 (2015).
47. **L. Liang**, J. Wang, W. Lin, B. G. Sumpter, V. Meunier, M. Pan, "Electronic Bandgap and Edge Reconstruction in Phosphorene Materials", Nano Letters, 14, 6400 (2014).
48. S. Huang, X. Ling, **L. Liang**, J. Kong, H. Terrones, V. Meunier, M. S. Dresselhaus, "Probing the Interlayer Coupling of Twisted Bilayer MoS_2 Using Photoluminescence Spectroscopy", Nano Letters, 14, 5500 (2014).
49. J. Cai., C. A. Pignedoli, L. Talirz, P. Ruffieux, H. Söde, **L. Liang**, V. Meunier, R. Berger, R. Li, X. Feng, K. Müllen, R. Fasel, "Graphene nanoribbon heterojunctions", Nature Nanotechnology, 9, 896 (2014).
50. G. Li, **L. Liang**, Q. Li, X. He, A. Karki, V. Meunier, R. Jin, J. Zhang, E. Plummer, "Role of antiferromagnetic ordering in the (1×2) surface reconstruction of $Ca(Fe_{1-x}Co_x)_2As_2$", Physical Review Letters, 112, 077205 (2014).
51. **L. Liang**, V. Meunier, "First-principles Raman spectra of MoS_2, WS_2 and their heterostructures", Nanoscale, 6, 5394 (2014).
52. B. G. Sumpter, **L. Liang**, A. Nicolaï, V. Meunier, "Interfacial Properties and Design of Functional Energy Materials", Accounts of Chemical Research, 47, 3395 (2014).
53. E. C. Girão, **L. Liang**, V. Meunier, "Heterospin Junctions in Zigzag-Edged Graphene Nanoribbons", Applied Sciences, 4, 351 (2014).
54. **L. Liang**, V. Meunier, "Electronic and thermoelectric properties of assembled graphene nanoribbons with elastic strain and structural dislocation", Applied Physics Letters, 102, 143101 (2013).
55. **L. Liang**, E. C. Girão, V. Meunier, "Quasiparticle band gaps of graphene nanowiggles and their magnetism on Au(111)", Physical Review B, 88, 035420 (2013).
56. E. Girão, **L. Liang**, J. Owens, E. Silva, B. Sumpter, V. Meunier, book chapter "Electronic Transport in Graphitic Carbon Nanoribbons", in book "Graphene Chemistry: Theoretical Perspective", John Wiley & Sons (2013).
57. **L. Liang**, V. Meunier, "Electronic structure of assembled graphene nanoribbons: Substrate and many-body effects", Physical Review B, 86, 195404 (2012).
58. **L. Liang**, E. Cruz-Silva, E. C. Girão, V. Meunier, "Enhanced thermoelectric figure of merit in assembled graphene nanoribbons", Physical Review B, 86, 115438 (2012).

59. E. C. Girão, E. Cruz-Silva, **L. Liang**, A. Filho, V. Meunier, "Structural and electronic properties of graphitic nanowiggles", Physical Review B, 85, 235431 (2012).
60. E. C. Girão, **L. Liang**, E. Cruz-Silva, A. Filho, V. Meunier, "Emergence of atypical properties in assembled graphene nanoribbons", Physical Review Letters, 107, 135501 (2011).
61. W. Ren, **L. Liang**, F. Qi, H. Zhu, X. Yu, H. Quan, Q. Gong, "Bimodal fluorescence and magnetic resonance imaging using water-soluble hexagonal $NaYF_4$:Ce,Tb,Gd nanocrystals", Journal of Nanomaterials, 70 (2011).
62. Y. Ding, **L. Liang**, M. Li, D. He, L. Xu, P. Wang, X. Yu, "Efficient manganese luminescence induced by Ce^{3+}-Mn^{2+} energy transfer in rare earth fluoride and phosphate nanocrystals", Nanoscale Research Letters, 6 (2011).
63. Y. Xiang, X. Xu, D. He, M. Li, **L. Liang**, X. Yu, "Fabrication of rare-earth/quantum-dot nanocomposites for color-tunable sensing applications", Journal of Nanoparticle Research, 13, 525 (2011).
64. Z. Chen, C. Lian, D. Zhou, **L. Liang**, X. Yu, "Greatly enhanced and controlled manganese photoluminescence in water-soluble ZnCdS:Mn/ZnS core/shell quantum dots", Chemical Physics Letters, 488, 73 (2010).

Collaborators

Dr. Marija Drndić (University of Pennsylvania, USA); Dr. Mauricio Terrones (Pennsylvania State University, USA); Dr. Jing Kong (Massachusetts Institute of Technology, USA); Dr. Xi Ling (Boston University, USA); Dr. Shengxi Huang (Pennsylvania State University, USA); Dr. Deji Akinwande (University of Texas at Austin, USA); Dr. David Mandrus (University of Tennessee at Knoxville, USA); Dr. Philip Rack (University of Tennessee at Knoxville, USA); Dr. An-Ping Li (Oak Ridge National Laboratory, USA); Dr. David Geohegan (Oak Ridge National Laboratory, USA); Dr. Jean-Christophe Charlier (Universite Catholique de Louvain, Belgium); Dr. Roman Fasel (Swiss Federal Laboratories, Switzerland); Dr. Ping-Heng Tan (Institute of Semiconductors, China); Dr. Jin Zhang (Peking University, China); Dr. Eduardo Girão (Universidade Federal do Piaui, Brazil).