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Stanford PULSE Institute  
SLAC National Accelerator Laboratory  
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## 1 Research Interests

Extending Attosecond Physics from atoms to solids  
Ultrafast spectroscopy of quantum materials using high-order harmonic generation  
X-ray nonlinear optics using free-electron lasers  
Development of ultrafast lasers and short wavelength light sources

## 2 Education

### **University of Michigan, Ann Arbor, MI**

Postdoctoral training 2007- 2009  
Advisor: David A. Reis

### **Kansas State University, Manhattan, KS**

Ph.D. in Physics 2003-2007  
Thesis: Study on generation of attosecond pulse using polarization gating  
Advisor: Zenghu Chang  
M.S. in Physics 2002-2003  
Thesis: High-order harmonic generation in molecules  
advisor: Zenghu Chang

## 3 Awards and Recognitions

- OPTICA (OSA) Fellow 2024, for pioneering contributions to strong-field and attosecond physics in condensed matter, including nonperturbative high-harmonic generation from band-insulators and quantum materials
- Department of Energy Early Career award, 2014 -2019, for the study of high-harmonic generation in solids
- Co-authored a few papers with 2023 physics nobel prize awardee Pierre Agostini

## 4 Professional experience

<b>Lead Scientist</b> (2018-Current)	<b>PULSE Institute, SLAC National Accelerator Laboratory</b> <ul style="list-style-type: none"><li>• Group leader, Attosecond Photonics Group.</li><li>• Developing research programs at the intersection of condensed matter physics and ultrafast AMO</li><li>• Planning and conducting beamtimes at X-ray free-electron laser facilities</li></ul>
<b>Associate Staff Scientist</b> (2013-2018) <b>(tenured)</b>	<b>PULSE Institute, SLAC National Accelerator Laboratory</b> <ul style="list-style-type: none"><li>• Group leader, Attosecond Photonics Group.</li><li>• Planning and executing experimental and theory collaboration in the areas of attosecond physics in solids</li></ul>
<b>Research Associate</b> (2009-2013)	<b>PULSE Institute, SLAC National Accelerator Laboratory</b> <ul style="list-style-type: none"><li>• Conducted first solid-state HHG experiments</li><li>• Conducted first AMO experiments at the LCLS and SACLA</li></ul>
<b>Postdoctoral associate</b> (2007-2009)	<b>Physics Department, University of Michigan</b> <ul style="list-style-type: none"><li>• Designed and built an instrument for HHG in rare gas solids</li><li>• Contributed in time-resolved X-ray diffraction experiments at Argonne National Laboratory</li></ul>
<b>Research Assistant</b> (2003-2007)	<b>J. R. Macdonald Lab, Kansas State University</b> <ul style="list-style-type: none"><li>• Isolated attosecond pulse generation using polarization gating</li><li>• High-order harmonic generation in molecules</li></ul>
<b>Teaching Assistant</b> (2002-2003)	<b>Department of Physics, Kansas State University</b> <ul style="list-style-type: none"><li>• Introduction to optics, Modern optics, and Lasers</li></ul>
<b>Assistant Lecturer</b> (2000-2002)	<b>Tribhuvan University, Kirtipur, Kathmandu, Nepal</b> <ul style="list-style-type: none"><li>• Biomedical Physics for M.Sc., Laboratory Classes for M.Sc.</li></ul>

## 5 Important Grants

- **Frontiers in high harmonic generation**, Atomic molecular and optical sciences (AMOS) program, Chemical Sciences Geosciences, and Biosciences (CSGB), Basic Energy Sciences (BES), U.S. Department of Energy, 10/01/2019-09/30/2022, current grant, amount 1.6 M\$
- Early Career Award, **Strongly-driven attosecond electron dynamics in periodic**

**media**, Atomic molecular and optical sciences (AMOS) program, Chemical Sciences Geosciences, and Biosciences (CSGB), Basic Energy Sciences (BES), U.S. Department of Energy, 07/16/2014-07/15/2019, completed, amount 2.5 M\$

- Laboratory Directed Research and Development (LDRD) project, **Prototype for a microjoule-class femtosecond XUV source**, SLAC National Accelerator Laboratory, 10/01/2013-09/30/2015, completed, amount 3M\$

## 6 Leadership Roles and Professional Services

- Contributed in the yearly LCLS users meetings series including the latest 2022 meeting with presentation in the QRIXS session
- Contributed in workshops intended to discover Science Opportunities Enabled by the LCLS-II, June 2015  
link.
- Led a Laboratory Directed Research and Development (LDRD) collaboration spanning over multiple directorates at SLAC, compact XUV light source based on HHG from nano-droplets and solid targets (2014-2016)
- Organized and chaired a conference session, Attosecond Dynamic Imaging (FF3C), 14:00 -16:00, Friday, CLEO 2019
- Organized and chaired a conference session, Strong-field Physics in Solids (FF3P), 14:00 to 16:00, CLEO 2018
- Committee member, Fundamental Science FS7, CLEO (2016-2019)
- Organized and chaired a special symposium in strong-field processes at DAMOP 2015
- OSA International Workshop on Compact EUV and X-ray Light Sources, Washington, DC, October 30-31(2014)
- Co-organized a workshop on nonlinear X-ray Science and Optics, SLAC, Menlo Park, CA (2011)
- Scientific advisory committee member, ANPA, Association of Nepali Physicists in America, (2019-current)
- Grant proposal reviewer, National Science Foundation and Department of Energy, USA
- Grant proposal reviewer, DFG, Deutsche Forschungsgemeinschaft grants, Germany
- Grant proposal reviewer, ERC, European Research Council grants

## 7 Teaching and Advising

### 7.1 Courses Taught

(2023-2024) APPPHYS 283, Ultrafast Quantum Physics, Physics and Applied physics Departments, Stanford University

(2003-2005) 3 graduate level optics classes, 1 undergraduate EP studio, lab setup, grading, Department of Physics, Kansas State University

(2000-2002) M.Sc. Second year, Theory class, Biomedical Physics, Department of physics, Tribhuvan University, Kathmandu, Nepal

(2000-2002) M.Sc. First and second year, General physics lab class, Department of physics, Tribhuvan University, Kathmandu, Nepal

(2000-2002) Physics for engineers, Kantipur Engineering College, Kathmandu, Nepal

### 7.2 Postdoctoral Scholars (Current)

1. Dr. Christian Heide, 2. Dr. Rubbaiat Sheikh

### 7.3 Postdoctoral Scholars (Former)

3. Dr. Yuki Kobayashi, 20210-2023, currently Assistant professor at University of Michigan

4. Dr. Denitsa Baykusheva, 2019-2021, currently Assistant professor in Austria

5. Dr. YongSing You, 2014-2018, permanent scientist at Samba TV

6. Dr. Eric Cunningham, 2016-2017, scientist at SLAC National Accelerator Laboratory

7. Dr. Bianca Iwan, 2016-2018, an entrepreneur in a Bay area start-up

8. Dr. Jian Lu, 2017-2019, moved to University of Pennsylvania

### 7.4 Ph.D. Students

1. Matthew Hurley, 2023-current, PhD rotation student

2. Chance Caleb Ornelas-Skarin, 2021-current, PhD student

3. Georges Ndabashimiye, 2010-2016, Thesis title, **“High Harmonic Generation and Other Strong Fields Effects in Rare Gas Solids”**, optical engineer, Microsoft

4. Hanzhe Liu, 2013-2019, Thesis title, **“Generation and control of solid-state high harmonics at nanoscale”**, assistant professor at Purdue University

### 7.5 Dissertation Evaluation as External

Mrs. Mumta Hena Mustary, PhD Thesis: **Probing the Dynamics of Atoms and Molecules by High Harmonic Generation**, Principal supervisors Robert Sang and Igor Litvinyuk, School of

Environment and Science, **Griffith University**, Australia.

## 7.6 M.S. Students

David Nicolson, 2011-2012, high-harmonics from pulse-shaped lasers

## 7.7 Undergraduate Students

1. Make (John) Ying, 2018 summer, Ultrafast laser oscillator training and high harmonics
2. Joe William, 2008-2009, high-harmonics from solid argon

## 7.8 External scientists and visitors mentored

1. Alexis S. Chacon, Junior group leader, Max Plank Research-Initiative, Korea; performed theory, published papers together
2. Hamed Merdji, CEY, Peris, France, solid-state HHG training to the group, published several papers independently now
3. Christian Rdel, Scientist, University of Jena, Germany.

## 8 Summer Schools and Public Lectures

- Ultrafast X-ray Summer School (UXSS) 2022, 12-16 June 2023, Co-chair
- Public lecture on the Nobel prize in physics 2023, organized by Association of American Physicists in America (ANPA), October 14, 2023
- Extreme Light Infrastructure Summer School (ELISS) 2020, 26-28 August 2020, Lecture on HHG in solids
- Public lecture on The Most Powerful X-ray Machine, Global Nepali Professional Network (GNPN), 22 September 2019
- Public lecture on Particle Accelerator Technology Enables Ultrafast X-ray Science: Linac Coherent Light Source, Association of Nepali Physicists in America (ANPA) conference, 19 July 2020
- Public lecture on Faster and Reliable Electronics for the Future, National Knowledge Convention, 03 July 2020

## 9 Popular Press

- [67] Floquet Engineering of Quantum Materials, Engrid Fadelli, Phys.org, January 20, 2023, [link](#)
- [66] Exploring Quantum Electron Highways With Laser Light, Glendda Chui, SLAC today, August 18, 2022, [link](#)
- [65] Investigating Topological Insulators with High Harmonics, Synopsis, Physics 14, s 18, by Erica Carlson, February 2, 2021
- [64] In a First, Physicists Glimpse a Quantum Ghost, comment by Karmela Padavid-Callaghan, Scientific American, December 8, 2021
- [63] Circular Light Can Probe Topological Insulators, Optics and Photonics News, by Edwin Cartlidge, February 10, 2021
- [62] A New Hands-off Probe Uses Light to Explore The Subtleties Of Electron Behavior In A Topological Insulator, Glenda Chui, SLAC today, February 2, 2021
- [61] My Journey: Dr. Shambhu Ghimire, published by ANPA-Global 2019
- [60] Study Reports High-harmonic Generation In An Epsilon-near-zero Material, Ingrid Fadelli, Phys.org , August 15, 2019
- [59] Nature photonics news and views, Locking the waveform with a quartz crystal, 12, 5, 256, 2018.
- [58] A Potential New and Easy Way to Make Attosecond Laser Pulses: Focus A Laser On Ordinary Glass, SLAC Today, Glendda Chui, September 28, 2017,[link](#)
- [57] New Tabletop Technique Probes Outermost Electrons of Atom Deep Inside Solids, Glendda Chui, SLAC Today, November 21, 2016
- [56] Scientists Use A Frozen Gas to Boost Laser Light to New Extremes, Glendda Chui, SLAC Today, June 6, 2016

[55] Our Choice From The Recent Literature, Optical materials, Nature photonics 4, 128, 2010

[54] News and views, High-harmonic Generation: Solid Progress, J. P. Marangos, Nature Physics, February 01, 2011 (Also was on the cover),  
<http://www.nature.com/nphys/journal/v7/n2/full/nphys1913.html>

[53] Researchers Get First Glimpse Of Light-boosting Effect In A Solid, Lauren Rugani, SLAC Today, December 9, 2010, link

## 10 Peer-reviewed Journals

[52] J. Shi, H. Xu, C. Heide, C. H. Fu, C. Xia, F. d. Quesada, H. Shen, T. Zhang, L. Yu, A. Johnson, F. Liu, E. Shi, L. Jiao, T. Heinz, **S. Ghimire**, J. Li, J. Kong, Y. Guo, A. M. Lindenberg, “**Giant room-temperature nonlinearities from a monolayer Janus topological semiconductor**”, Nature Comm 14, 4953 (2023)

[51] Y. Kobayashi, C. Heide, A. C. Johnson, F. Liu, D. A. Reis, T. F. Heinz, and **S. Ghimire**, “**Floquet engineering of strongly-driven excitons in monolayer tungsten disulphide**”, Nature Physics, 19, 171-176 (2023)

[50] C. Heide, Y. Kobayashi, A. C. Johnson, T. F. Heinz, D.A. Reis and **S. Ghimire**, “**High-harmonic generation from artificially stacked 2d-crystals**”, Nanophotonics, 12, 2, 255-261 (2023)

[49] Z. Chang, L. Fang, V. Fedorov, C. Geiger, **S. Ghimire**, C. Heide, N. Ishii, J. Itatani, C. Joshi, Y. Kobayashi, P. Kumar, A. Marra, S. Mirov, I. Petrushina, M. Polyanskiy, D. Reis, S. Tochitsky, S. Vasilyev, L. Wang, Y. Wu and F. Zhou, “**Intense infrared lasers for strong-field**” science. Advances in Optics and Photonics 14, 4, 652-782 (2022)

[48] C. Heide, Y. Kobayashi, D. R. Baykusheva, D. Jain, J. A. Sobota, M. Hashimoto, P. S. Kirchmann, S. Oh, T. F. Heinz, D. A. Reis, and **S. Ghimire**, “**Probing topological phase transitions using high-harmonic generation**,” Nature Photon 16, 620-624 (2022)

[47] Y. Lang, Z. Peng, J. Liu, Z. Zhao, and **S. Ghimire**, “**Proposal for high-energy cutoff extension of optical harmonics of solid materials using the example of a**

**one-dimensional ZnO crystal**”, Phys. Rev. Lett 129, 16, 167402, (2022)

[46] C. Heide, Y. Kobayashi, A. Johnson, F. Liu, T. F. Heinz, D. A. Reis, and **S. Ghimire**, **“Probing Electron-Hole Coherence in Strongly Driven 2D Materials using High-Harmonic Generation”** Optica 9, 512-516 (2022)

[45] S. Ghimire, **“Probing attosecond phenomena in solids”**, Nature Photonics 16,1,7-9 (2022)

[44] Yuki Kobayashi, Christian Heide, Hamed Koochaki Keldarreh, Amalya Johnson, Fang Liu, Tony F Heinz, David A Reis, **Shambhu Ghimire**, **“Polarization flipping of even-order harmonics in monolayer transition metal dichalcogenides”** Ultrafast Science, AAAS, Special Issue Attosecond Science and Technology, 2021, doi: 10.34133/2021/9820716

[43] B. Kettle, A. Aquila, S. Boutet, P. H. Bucksbaum, G. Carini, Y. Feng, E. Gamboa, **S. Ghimire**, S. Glenzer, P. Hart, J. B. Hastings, T. Henighan, M. Hunter, J. Koglin, M. Kozina, H. Liu, M. J MacDonald, M. Trigo, D. A Reis and M. Fuchs, **“Anomalous two-photon Compton scattering**, New J. Phys 23, 115008 (2021)

[42] O. Gränäs, I. Vaskivskiy, P. Thunström, **S. Ghimire**, R. Knut, J. Sderström, L. Kjellsson, D. Turenne, R. Y. Engel, M. Beye, J. Lu, A. H. Reid, W. Schlotter, G. Coslovich, M. Hoffmann, G. Kolesov, C. Schuler-Langeheine, A. Styervoyedov, N. Tancogne-Dejean, M. A. Sentef, D. A. Reis, A. Rubio, S. S. P. Parkin, O. Karis, J. Nordgren, J.-E. Rubensson, O. Eriksson, H. A. Dürr **“Ultrafast modification of the electronic structure of a correlated insulator”**, Phys Rev R 4, L032030 (2022)

[41]. D. Baykusheva, A. Chacón, D. Kim, D. E. Kim, D. A. Reis, and **S. Ghimire**, **“Strong-field physics in three-dimensional topological insulators”**, Phys Rev A 103, 023101, 023101 (2021).

[40]. D. Baykusheva, A. Chacón, J. Lu, T. Bailey, J. Sobota, H. Soifer, P. Kirchmann, C. Rotundu, C. Uher, T. F. Heinz, D. Reis, and **S. Ghimire**, **“All-optical probe of three-dimensional topological insulators based on high-harmonic generation by circularly-polarized laser fields,”** Nano Lett. 21, 8970-8978 (2021)

[39] P. Chakraborti, B. Senfftleben, B. Kettle, S. W. Teitelbaum, P. H. Bucksbaum, **S. Ghimire**, J. B. Hastings, H. Liu, S. Nelson, T. Sato, S. Shwartz, Y. Sun, C. Weninger, D.



Zhu, D. A. Reis, M. Fuchs, “**Multiple Fourier Component Analysis of X-ray Second Harmonic Generation in Diamond**”, arXiv:1903.02824

[38] J. Li, J. Lu, A. Chew, S. Han, J. Li, Y. Wu, **S. Ghimire**, Z. Chang “**A Prospective on Attosecond Science based on high harmonic generation from gases and solids**”, Nature Communications 11, 2748 (2020).

[37] G. Vampa, J. Lu, Y. S. You, D. R. Baykusheva, M. Wu, H. Liu, K. J. Schafer, D. A. Reis, M. B. Gaarde and **S. Ghimire**, “**Attosecond synchronization of extreme ultraviolet high harmonics from crystals**”, 53, 14 (2020).

[36] Y. Yang, J. Lu, A. Manjavacas, T. S Luk, H. Liu, K. Kelley, J. Maria, E. L. Runnerstrom, M. B Sinclair, **S. Ghimire**, and I. Brener, “**High-harmonic generation from an epsilon-near-zero material**”. Nature Physics DOI: 10.1038/s41567-019-0584-7 (2019).

[35] Y.S. You, J. Chen, E. Cunningham, C. Roedel, and **S. Ghimire**, “**Crystal orientation-dependent polarization state of high-order harmonics**”, Optics Letters 44, 3, 53-533 (2019).

[34] J. Lu, E. Cunningham, Y. S. You, D. A. Reis and **S. Ghimire**, “**Interferometry of dipole phase in high harmonics from solids**, Nature Photonics 13, 96-100 (2019).

[33] **S. Ghimire** and D. Reis “**Review: high-order harmonic generation from solids**”, Nature Physics, 15, 10-16 (2019).

[32]**S. Ghimire**, “**Locking the waveform with a quartz crystal**”, NATURE PHOTONICS 12 (5), 256-257 (2018).

[31]Y. S. You, E. Cunningham, D. A. Reis and **S. Ghimire**, “**Probing periodic potential of the crystal via strong-field re-scattering**”, J. Phys. B: At. Mol. Opt. Phys. 51, 114002 (2018).

[30]G. Vampa, Y. S.You, H.Liu, **S. Ghimire**, and D. Reis, “**Observation of backward high-harmonic emission from solids**”, Optics express 26 (9), 12210-12218 ( 2018).

[29]M. Wu, Y. S.You, **S. Ghimire**, D. Reis, D. A. Browne, K. J Schafer, and M. Gaarde, “**Orientation dependence of temporal and spectral properties of high-order harmonics in solids**”, Physical Review A 96 (6), 063412 (2018).

- [28] Y. S. You, Y. Yin, A. Chew, X. Ren, S. Gholam-Mirzaei, M. Chini, Z. Chang, and **S. Ghimire**, “**High-harmonic generation in amorphous solids**”, Nature Communications, 8,724 ( 2017).
- [27] Y. S. You, M. Wu, Y. Yin, A. Chew, X. Ren, S. Gholam-Mirzaei, D. Brown, M. Chini, Z. Chang, K. Schafer, M. Gaarde and **S. Ghimire**, “**Laser wave-form control of high-harmonic generation in solids**, Optics Letters 42 (9), 1816-1819 (2017).
- [26] Y. S. You, D.A. Reis, and **S. Ghimire**, “**Anisotropic high-harmonic generation in bulk crystals** , Nature Physics 13, 345-349 (2017). *Associated news*: SLAC Today:link
- [25] H. Liu, Y. Li, Y. S. You, **S. Ghimire**, T. F. Heinz, and D. A. Reis, “**High-harmonic generation from an atomically thin semiconductor**”, Nature Physics 13, 262265 (2017).
- [24] G. Ndabashimiye, S. Ghimire, M. Wu, D.A. Browne, K.J. Schafer, M.B. Gaarde, and D. A. Reis, “**Solid-state harmonics beyond the atomic limit**”, Nature 534, 520-525, (2016).
- [23] **S. Ghimire**, M. Fuchs, J. Hastings, S. C. Herrmann, Y. Inubushi, J. Pines, S. Shwartz, M. Yabashi and D. A. Reis, “**Nonsequential two-photon absorption from the K shell in solid zirconium**”, Physical Review A 94 (4), 043418, (2016)
- [22] M. Fuchs, M. Trigo, J. Chen, **S. Ghimire**, M. Kozina, M. Jiang, T. Henighan, C. Bray, G. Ndabashimiye, S. Shwartz, Y. Feng, S. Boutet, G. Williams, M. Messerschmidt, S. Moeller, J. B. Hastings, and D. A. Reis, “**Anomalous nonlinear X-ray Compton scattering**”, Nature Physics 11, 964970 (2015).
- [21] M. Wu, **S. Ghimire**, D. A. Reis, K. J. Schafer, and M. B. Gaarde. “**High-harmonic generation from Bloch electrons in solids**, Physical Review A, 91(4):043839, (2015).
- [20] **S. Ghimire**, G. Ndabashimiye, A.D. DiChiara, E. Sistrunk, M.I. Stockman, P. Agostini, L.F. DiMauro, D.A. Reis, “**Strong-field and attosecond physics in solids**”, J. of Physics B: Atomic, Molecular and Optical Physics, 47, 20, 204030 (2014).
- [19] J. Goodfellow, M. Fuchs, D. Daranciang, **S. Ghimire**, F. Chen, H. Loos, D. Reis, A. S. Fisher, A. Lindenberg, “**Below gap optical absorption in GaAs driven by intense, single-cycle coherent transition radiation**” New J. of physics, 22, 14, 17423-17429 (2014).

- [18] M. Trigo, M. Fuchs, J. Chen, M. P. Jiang, M. E. Kozina, G. Ndabashimiye, M. Cammarata, G. Chien, S. Fahy, D. M. Fritz, K. Gaffney, **S. Ghimire**, A. Higginbotham, S. L. Johnson, J. Larsson, H. Lemke, A. M. Lindenberg, F. Quirin, K. Sokolowski-Tinten, C. Uher, J. S. Wark, D. Zhu, and D. A. Reis, “**Direct measurement of time-dependent density-density correlations in a solid through the acoustic analog of the dynamical Casimir effect**”, *Nature Physics*, 9, 790-794 (2013).
- [17] T.E. Glover, D.M. Fritz, M. Cammarata, T.K. Allison, J. Feldkamp, H. Lemke, D. Zhu, R.N. Coffee, M. Fuchs, **S. Ghimire**, J. Chen, S. Coh, S. Schwartz, D.A. Reis, S.E. Harris, and J. B. Hastings, “**X-ray and optical wave mixing**”, *Nature* doi:10.1038/11340 (2012).
- [16] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, G. Ndabashimiye, U. Szafruga, P. Agostini, L. F. DiMauro, and D. A. Reis, “**Generation and propagation of high-order harmonics in crystals**”, *Phys. Rev. A* 85, 043836 (2012).
- [15] A. D. DiChiara, **S. Ghimire**, C. I. Blaga, E. Sistrunk, E. P. Power, A. M. March, T. A. Miller, D. A. Reis, P. Agostini, and L. F. DiMauro, “**Scaling of high-order harmonic generation in the long wavelength limit of a strong laser field**”, 18, 419-433 (2012).
- [14] E. P. Kanter, B. Krässig, Y. Li, A. M. March, N. Rohringer, R. Santra, S. H. Southworth, L. F. DiMauro, G. Doumy, C. A. Roedig, N. Berrah, L. Fang, M. Hoener, P. H. Bucksbaum, **S. Ghimire**, D. A. Reis, J. D. Bozek, C. Bostedt, M. Messerschmidt, L. Young, “**Modifying Auger decay with femtosecond X-ray pulses**”, *Phys. Rev. Lett.* 107, 233001 (2011).
- [13] D. Daranciang, J. Goodfellow, M. Fuchs, H. Wen, **S. Ghimire**, D. A. Reis, H. Loos, A. S. Fisher, A. M. Lindenberg, “**Single-cycle terahertz pulses with  $> 0.2V/\text{\AA}$  field amplitudes generated by coherent transition radiation**”, *Appl. Phys. Lett.* 99, 141117 (2011).
- [12] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, U. Szafruga, P. Agostini, L. F. DiMauro, and D. A. Reis, “**Redshift in the Optical Absorption of ZnO Single Crystals in the Presence of an Intense Midinfrared Laser Field**”. *Phys. Rev. Lett.* 107, 167407 (2011).
- [11] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, P. Agostini, L. F. DiMauro, and D. A. Reis, “**Observation of high-order harmonic generation in a bulk crystal**”. *Nature Physics*, 85, 4, 043836 (2011)

- [10] Y.M. Sheu, M. Trigo, Y.J. Chien, C. Uher, D.A. Arms, E.R. Peterson, D.A. Walko, E.C. Landahl, J. Chen, **S. Ghimire**, and D. A. Reis, “**Kapitza conductance of Bi/sapphire interface studied by depth- and time-resolved X-ray diffraction**”, Solid State Comm. 151, 11, 826-829 (2011).
- [9] G. Doumy, C. Roedig, S.-K. Son, C.I. Blaga, A.D. DiChiara, R. Santra, N. Berrah, C. Bostedt, J. D. Bozek, P.H. Bucksbaum, J.P. Cryan, L. Fang, **S. Ghimire**, J.M. Glowia, M. Hoener, E. P. Kanter, B. Krassig, M. Messerschmidt, D. A. Reis, N. Rohringer, L. Young, P. Agostini, and L.F. DiMauro “**Nonlinear atomic response to intense, ultrashort x rays**”, Phys. Rev. Lett., 106, 083002 (2011).
- [8] L. Young, E. P. Kanter, B. Krssig, Y. Li, A. M. March, S. T. Pratt, R. Santra, S. H. Southworth, N. Rohringer, L. F. DiMauro, G. Doumy, C. A. Roedig, N. Berrah, L. Fang, M. Hoener, P. H. Bucksbaum, J. P. Cryan, **S. Ghimire**, J. M. Glowia, D. A. Reis, J. D. Bozek, C. Bostedt, M. Messerschmidt, “**Femtosecond electronic response of atoms to ultraintense x-rays**”, Nature, 466, 56 (2010).
- [7] M. Trigo, Y. M. Sheu, D. A. Arms, J. Chen, **S. Ghimire**, R. S. Goldman, E. Landahl, R. Merlin, E. Peterson, E. M. Reason, D. A. Reis, “**Probing unfolded acoustic phonons with X rays**”, Phys. Rev. Lett., 101, 2 (2008).
- [6] I. Ben-Itzhak, P. Q. Wang, A. M. Sayler, K. D. Carnes, M. Leonard, B. D. Esry, A. S. Alnaser, B. Ulrich, X. M. Tong, I. V. Litvinyuk, C. M. Maharjan, P. Ranitovic, T. Osipov, **S. Ghimire**, Z. Chang, and C. L. Cocke, “**Elusive enhanced ionization structure for  $H_2^+$  in intense ultrashort laser pulses**”, Phys. Rev. A, 78, 6 (2008).
- [5] **S. Ghimire**, X. Feng and Z. Chang, “**Measurement of attosecond XUV pulses generated with polarization gating by two-dimensional photoelectron spectroscopy**” Proc. SPIE 6703, 67030F (2007).
- [4] **S. Ghimire**, B. Shan, C. Wang, and Z. Chang, “**High-energy 6.2-fs pulses for attosecond pulse generation**”, LASER PHYSICS, 15, 6 (2005).
- [3] C. M. Maharjan, A. Alnaser, X. Tong, B. Ulrich, P. Ranitovic, **S. Ghimire**, Z. Chang, I. Litvinyuk, L. Cocke, “**Momentum imaging of doubly charged ions of Ne and Ar in the sequential ionization region**”, Phys. Rev. A, 72, 4 (2005).
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T, **S. Ghimire**, Z. Chang , C. D. Lin , C. L. Cocke , “**Simultaneous real-time tracking of wave packets evolving on two different potential curves in  $H_2^+$  and  $D_2^+$** ”, Phys. Rev. A, 72, 030702 (2005).

[1] B. Shan, **S. Ghimire**, and Z. Chang, “**Generation of a XUV supercontinuum at the plateau of high harmonic spectrum**”, JOURNAL OF MODERN OPTICS 52, 277-283 (2005).

## 11 Selected Conference Proceedings

[42] **Probing topological phase transition using high-order harmonic generation**, Invited talk, ATTO 9 conference, Jeju Island, Korea, July 9-14, 2023

[41] “**Probing topological phase transition using high-order harmonic generation**”, Invited talk, GRC Topological and Correlated Matter, Ventura, CA, May 28- June 02, 2023

[40] “**A tutorial on high-order harmonic generation from solids**”, Quantum battles, University College London, June 28-30, 2023

[39] C. Heide, Y. Kobayashi, A. Johnson, F. Liu, T. Heinz, D. A. Reis, S. Ghimire, “**Highly efficient high-harmonic generation from artificially stacked 2D materials** ’, CLEO 2022

[38] S. Ghimire, “**High-order harmonic generation from topological insulators** ”, APS march meeting invited talk 2021

[37] D. Baykusheva, J. Lu, J. A. Sobota, H. Soifer, C. R. Rotundu, P. S. Kirchmann, D. A. Reis, and **S. Ghimire**, “**High-Harmonic Generation from Topological Insulators**” DAMOP 2020.

[36] D. Baykusheva, J. Lu, J. A. Sobota, H. Soifer, C. R. Rotundu, P. S. Kirchmann, D. A. Reis, and **S. Ghimire**, “**High-Harmonic Generation from Topological Insulators**” CLEO 2019.

[35] D. Baykusheva, J. Lu, J. A. Sobota, H. Soifer, C. R. Rotundu, P. S. Kirchmann, D. A. Reis, and **S. Ghimire**, “**High-Harmonic Generation from Topological Insulators**”

SPIE 2020.

[34] Y. Yang, J. Lu, A. Manjavacas, T. S Luk, H. Liu, K. Kelley, J. Maria, E. L. Runnerstrom, M. B Sinclair, **S. Ghimire**, and I. Brener, “**High-harmonic generation from an epsilon-near-zero material**”. SPIE 2019.

[33] J. Lu, E. Cunningham, Y.S. You, D.A.Reis, and **S. Ghimire**, “**Direct interferometric measurement of coherence properties of high-harmonics from crystals**”, DAMOP 2018

[32] J. Lu, E. Cunningham, C. Rodell, D.A. Reis, and **S. Ghimire**, “**Emission phase of extreme ultraviolet high harmonics from bulk crystals**”, CLEO 2018

[31] Y. You, E. Cunningham, D.A. Reis and **S. Ghimire**, “**Polarimetry of high harmonics in bulk crystals**”, CLEO 2018

[30] Y. You, M. Wu, Y. Yin, A. Chew, X. Ren, S. Gholam-Mirzaei, D. A. Browne, M. Chini, Z. Chang, K. J. Schafer, M. B. Gaarde, and **S. Ghimire** “**Waveform control of high-harmonic generation in solids**” , CLEO 2017

[29] E. Cunningham, Y. You, D. A. Reis and **S. Ghimire**, “**Phase-coherence of high-order harmonics from bulk crystals using homodyne detection**”, CLEO 2017

[28] Y. You, D. Reis, and **S. Ghimire**, “**High harmonics from solids probe Angstrom scale structure**”, CLEO 2016

[27] H. Liu, Y. Li, Y. You, **S. Ghimire**, T. F. Heinz, and D. A. Reis, “**Observation of High-Harmonic Generation from an Atomically Thin Semiconductor**”, Ultrafast Phenomena 2016

[26] Y. You, D. Reis, and **S. Ghimire**, “**High harmonics from solids probe Angstrom scale structure**”, DAMOP 2016

[25] H. Liu, Y. Li, Y. You, **S. Ghimire**, T. F. Heinz, and D. A. Reis, “**Observation of High-Harmonic Generation from an Atomically Thin Semiconductor**”, APS March Meeting 2016

[24] G. Ndabashimiye, **S. Ghimire**, D. Nicholson and D. A. Reis, “**Measurement of**

**coherence lengths of below threshold harmonics in solid argon**”, CLEO, San Jose, CA (2013).

[23] M. Fuchs, M. Trigo, J. Chen, **S. Ghimire**, M. Kozina, M. Jiang, T. Henighan, C. Bray, G. Ndabashimiye, S. Shwartz, Y. Feng, S. Boutet, G. Williams, M. Messerschmidt, S. Moeller, J. B. Hastings, and D. A. Reis, “**X-ray nonlinear Compton scattering**”, 50 years of Nonlinear Optics International Symposium, Barcelona, Spain (2012).

[22] **S. Ghimire**, G. Ndabashimiye, A. D. DiChiara, E. Sistrunk, U. Szafruga, P. Agostini, L. F. DiMauro, and D. A. Reis, “**Strong-field effects in solids**”, CLEO, San Jose, CA (2012).

[21] **S. Ghimire**, G. Ndabashimiye and D. A. Reis “**High-order harmonic generation in solid argon**”, CLEO, San Jose, CA (2012).

[20] C. Roedig, G. Doumy, S.-K. Son, C. I. Baga, A. D. DiChiara, R. Santra, N. Berrah, C. Bostedt, J. D. Bozek, P. H. Bucksbaum, J. P. Cryan, L. Fang, **S. Ghimire**, J. M. Glowina, M. Hoener, E. P. Kanter, B. Kraessig, M. Kuebel, M. Messerschmidt, G. G. Paulus, D. A. Reis, N. Rohringer, L. Young, P. Agostini, and L. F. DiMauro “**Multi photon physics at the LCLS**”, OSA annual meeting (2011).

[19] G. Doumy, S. Son, C. Roedig, C. I. Balga, A. DiChiara, M. Messerschmidt, C. Bostedt, J. Bozek, P. Bucksbaum, J. Cryan, J. M. Glowina, **S. Ghimire**, L. Fang, M. Hoener, N. Berrah, E. Kanter, B. Kraessig, D. Reis, L. Young, “**Nonlinear atomic response to intense, ultrashort x rays**”, DAMOP, Atlanta, GA (2011)

[18] S. Southworth, G. Doumy, D. Ray, E. Kanter, B. Kraessig, Y. Li, L. Young, J. Kuepper, J. Bozek, C. Bostedt, M. Messerschmidt, N. Berrah, L. Fang, B. Murphy, T. Osipov, J. Cryan, J. glowina, **S. Ghimire**, N. Kryzhevoi, L. Cederbaum, R. Santra, “**Double core-hole electron spectroscopy of formamide**”, DAMOP, Atlanta, GA (2011).

[17] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, L. F. DiMauro, P. Agostini, and D. A. Reis, “**Strong-field induced optical absorption in ZnO crystal**”, CLEO, Baltimore, MD (2011).

[16] D. Daranciang, J. Goodfellow, **S. Ghimire**, H. Loos, D. Reis, A. S. Fisher, and A. M. Lindenberg, “**Generation of  $> 100 \mu\text{J}$ , Broadband THz Transients with  $> 10 \text{ MV/cm}$  Fields via Coherent Transition Radiation at the Linac Coherent Light Source**”, CLEO, Baltimore, MD (2011).

- [15] D. Daranciang, J. Goodfellow, **S. Ghimire**, H. Loos, D. Reis, A. S. Fisher, A. M. Lindenberg “**Generation of intense, broadband, high-field THz pulses via coherent transition radiation at the Linac Coherent Light Source**”, OTST, Santa Barbara, CA (2011).
- [14] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, L. F. DiMauro, P. Agostini, and D. A. Reis, “**High-order harmonic generation in strongly-driven periodic solid**”, Gordon Conferences, Tilton School, NH (2010).
- [13] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, L. F. DiMauro, P. Agostini, and D. A. Reis, “**High-order harmonic generation in strongly-driven periodic solid**”, DAMOP, Houston, TX (2010).
- [12] **S. Ghimire**, A. D. DiChiara, E. Sistrunk, L. F. DiMauro, P. Agostini, and D. A. Reis, “**High-harmonic generation in strongly driven bulk periodic solid**”, CLEO Postdeadline , San Jose, CA (2010).
- [11] M. M. Shakya, S. Gilbertson, C. Li, E. Moon, Z. Duan, J. Jacket, **S. Ghimire**, and Z. Chang, “**Effects of carrier envelope phase on single shot XUV supercontinuum measurements**”, CLEO, Baltimore, MD (2006).
- [10] M. M. Shakya, S. Gilbertson, C. Nakamura, C. Li, E. Moon, Z. Duan, J. Tackett, **S. Ghimire** and Z. Chang, “**Effect of carrier envelope phase on single shot XUV supercontinuum measurements**”, DAMOP, Knoxville, TN (2006).
- [9] **S. Ghimire**, B. Shan, C. Nakamura, C. Wang and Z. Chang, “**The effects of ionization on the generation of high energy 6 fs pulses**”, DAMOP , Lincoln, NE, (2005).
- [8] C. M. Maharjan, A. S. Alnaser, X. M. Tong, P. Ranitovic, **S. Ghimire**, B. Shan, Z. Chang, I. Litvinyuk, and C. L. Cocke “**COLTRIMS studies of correlation in the sequential release of two electrons from Ar and Ne by short laser pulses**”, DAMOP, Lincoln, NE (2005).
- [7] Z.Chang, B. Shan, **S. Ghimire**, “**Generation XUV supercontinuum and attosecond Pulses**”, CLEO 2005, Sanfrancisco, CA (2005).
- [6] **S. Ghimire**, M. Shakya and Z. Chang, “ **High energy 6 fs pulses for generating a**



**single shot XUV supercontinuum**” International Conference on Multiphoton Processes(ICOMP) , Orford, QC, Canada (2005).

[5] **S. Ghimire**, B. Shan and Z. Chang, “**Characterization of laser pulses with a time-dependent ellipticity for the generation of attosecond x-ray pulses**”, Workshop on Ultrafast X-ray science, San Diego, CA (2004).

[4] **S. Ghimire**, B. Shan, and Z. Chang, “**The effect of orbital symmetry on high harmonic generation in molecules**”, Super intense laser atom physics (SILAP), Dallas, TX (2003).

[3] B. Shan, **S. Ghimire**, C. Wang and Z. Chang “**Comparison of ellipticity dependence of high order harmonic generation from molecules and atoms**”, DAMOP, Boulder, CO (2003).

[2] B. Shan, **S. Ghimire** and Z. Chang, “**Generation of single attosecond pulse in high harmonic plateau**”, Super intense laser atom physics (SILAP), Dallas, TX (2003).

[1] B. Shan, **S. Ghimire**, C. Wang and Z. Chang, “**Generation of XUV supercontinuum and single attosecond pulse by polarization gating**”, OSA meeting, Tucson, AZ, (2003).

\*\*Link to google scholar for updated publication list\*\* click

## 12 Seminars and Colloquia

[23] **Strong-field processes in 2D crystals and topological insulators**, CCQO colloquium lecture, University of Rochester, October 19, 2023

[22] **Ultrafast dynamics in quantum materials**, 03/11/2021, Colloquium Old Dominion University, Norfolk, Virginia

[21] **Ultrafast spectroscopy in quantum materials**, 03/04/2020, QFARM seminar series for quantum science and engineering at Stanford University

[20] **Ultrafast spectroscopy in quantum materials**, 02/18/2020, Condensed Matter Physics Seminar, Stony Brook University, Stony Brook, New York

- [19] **Fundamentals of high-harmonics from solids**, ATTO 2019, July 1-5, 2019, Szeged, Hungary
- [18] **Solids in strong laser fields**, Physics Colloquium, 02/28/2019, University of California, Riverside
- [17] **Solids in strong laser fields**, Physics Colloquium, 01/15/2019, Georgia State University
- [16] **New ultrafast probe for materials**, Physics Colloquium, San Francisco State University, 10/01/2018
- [15] **First experiments in solid-state HHG**, invited talk, APS march meeting, Los Angeles, California 03/05/2018
- [14] **Solids in strong field**, Special Seminar, Lawrence Berkeley National Lab, Berkeley, California, 02/02/2018
- [13] **High-order harmonics from bulk and 2D crystals**, IEEE, Lake Buena Vista, Orlando, Florida, October 01/05/2017
- [12] **Strong-field physics in dense media**, Physics Colloquium, Kansas State University, Manhattan, KS, Sept 09/05/2017
- [11] **High-order harmonics from bulk and 2D crystals**, European CLEO, Munich, Germany, 06/23-27/2017
- [10] **Anisotropy in high harmonics from solids**, Physics of Quantum Electronics (PQE)-2017, Snowbird, Utah, 01/8-13/2017
- [9] **Anisotropy in high-harmonics from bulk and 2D crystals**, DAMOP, Sacramento, CA, 2017
- [8] **Strong-field processes in solids**, Lecture, University of Ottawa, Ottawa, Canada, 02/04/2015.
- [7] **Wavelength scaled strong-field studies in solids**, Ultrafast X-ray Seminar, Lawrence Berkeley National Lab, Berkeley, CA, 03/15/2012.

[6] **High-order harmonic generation in bulk crystals**, Photon Science Seminar, SLAC, Menlo Park, CA, 03/09/2011.

[5] **High-order harmonic generation in strongly-driven periodic solid**, Gordon Conference on Multiphoton Processes, Tilton School, selected in hot-topics, 06/10/2010.

[4] **High-harmonic generation in strongly driven bulk periodic solid**, CLEO Post-deadline talk, San Jose, CA, CLEO, 05/20/2010.

[3] **Single attosecond pulses by polarization gating of high-order harmonics**, Special Atomic Physics Seminar, University of Colorado, JILA, 05/15/2007.

[2] **Single attosecond pulses by polarization gating of high-order harmonics**, Special FOCUS Seminar, University of Michigan, Department of Physics, Ann Arbor, MI, 05/04/2007.

[1] **Single attosecond pulses by polarization gating of high-order harmonics**, Special Atomic Physics Seminar, University of New Mexico, Department of Physics, Albuquerque, NM, 05/02/2007.

### 13 Journal Review:

Science, Science Advances, Nature, Nature physics, Nature photonics, Nature communications, Physics Review Letters, Physics Review A, Physics Review B, Optics Letters, Optics Express, etc.

### 14 Scientific Organizations Membership:

American Physical Society, Optical Society of America, Association of Nepali Physicists in America