Shambhu Ghimire

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1 Research Interests

Ultrafast spectroscopy of novel quantum materials using high-order harmonic generation
Strong-field and attosecond physics in atoms, molecules, and solids
X-ray nonlinear optics using X-ray free-electron lasers
Development of ultrafast lasers and short wavelength light sources

2 Education

University of Michigan
Postdoctoral training, July 2007- Jan 2009,
Subject: Ultrafast Condensed Matter Physics
Advisor: David A. Reis

Kansas State University
PhD in Physics, 2003-2007
Thesis: Study on generation of attosecond pulse using polarization gating
Advisor: Zenghu Chang
MS 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

4 Professional experience

Lead Scientist	PULSE Institute, **SLAC National Accelerator Laboratory**
(2018-Current)	• Group leader, Attosecond Photonics Group.
	• Developing research programs at the intersection of condensed matter physics and ultrafast AMO
	• Planning and conducting beamtimes at X-ray free-electron laser facilities
Associate Staff Scientist	PULSE Institute, **SLAC National Accelerator Laboratory**
(2013-2018)	• Group leader, Attosecond Photonics Group.
(tenured)	• Planing and executing experimental and theory collaboration in the areas of attosecond physics in solids
Research Associate	PULSE Institute, **SLAC National Accelerator Laboratory**
(2009-2013)	• Conducted first solid-state HHG experiments
	• Conducted first AMO experiments at the LCLS and SACLA
Postdoctoral associate	Physics Department, **University of Michigan**
(2007-2009)	• Designed and built an instrument for HHG in rare gas solids
	• Contributed in time-resolved X-ray diffraction experiments at Argonne National Laboratory
Research Assistant	J. R. Macdonald Lab, **Kansas State University**
(2003-2007)	• Isolated attosecond pulse generation using polarization gating
	• High-order harmonic generation in molecules
Teaching Assistant	Department of Physics, **Kansas State University**
(2002-2003)	• Introduction to optics, Modern optics, and Lasers
Assistant Lecturer	**Tribhuvan University**, Kirtipur, Kathmandu, Nepal
(2000-2002)	• Biomedical Physics for M.Sc., Laboratory Classes for M.Sc.

5 Important Research Grants

• **Ultrafast spectroscopy in extended media**, Atomic molecular and optical sciences (AMOS) program, Chemical Sciences Geosciences, and Biosciences (CSGB), Basic Energy Sciences (BES), U.S. Department of Energy, 09/30/2022- current grant, amount 1.6 M$

• **Electron analyzer for time-resolved photoemission spectroscopy of 2d crystals**

and interfaces, Atomic molecular and optical sciences (AMOS) program, Chemical Sciences Geosciences, and Biosciences (CSGB), Basic Energy Sciences (BES), U.S. Department of Energy, 09/30/2022- current grant, amount 0.5 M$

• **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, completed, 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

• Laser Science sub-committee chair for Attosecond, Strong-field and and XFEL Science, 2023 to 2025
• 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, 3. Jiaojian Shi

7.3 Postdoctoral Scholars (Former)

4. Dr. Yuki Kobayashi, 20210-2023, currently Assistant professor at University of Michigan
5. Dr. Denitsa Baykusheva, 2019-2021, currently Assistant professor in Austria
6. Dr. YongSing You, 2014-2018, permanent scientist at Samba TV
7. Dr. Eric Cunningham, 2016-2017, scientist at SLAC National Accelerator Laboratory
8. Dr. Bianca Iwan, 2016-2018, an entrepreneur in a Bay area start-up
9. 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

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

7.7 Undergraduate Students (advisory role, duration, project)

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

7.8 External scientists and visitors mentored

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

8 Summer Schools and Public Lectures

• Ultrafast X-ray Summer School (UXSS) 2024, 17-20 June 2024, Chair.
• SAGE, Science Accelerating Girl's Engagement Volunteer, SLAC, 2024
• Ultrafast X-ray Summer School (UXSS) 2023, 12-16 June 2023, Co-chair.
• Extreme Light Infrastructure Summer School (ELISS) 2020, 26-28 August 2020, Lecture on HHG in solids.
• Global Nepali Professional Network (GNPN), 22 September 2019 Public lecture on The Most Powerful X-ray Machine.
• Association of Nepali Physicists in America (ANPA) conference, 19 July 2020, Public lecture on Particle Accelerator Technology Enables Ultrafast X-ray Science: Linac Coherent Light Source
• National Knowledge Convention, 03 July 2020, Public lecture on Faster and Reliable Electronics for the Future

9 Seminars and Workshops

[42] Invited talk, High-order Harmonic Generation in Solids, Laser physics workshop, LPHYS24, So Carlos, July 3-9, (2024)

[41] Colloquium, Frontiers in Attosecond Physics, Physics Department and CREOL, University of Central Florida, May 20, (2024)

[40] Colloquium, Attosecond Physics in Atoms, Molecules, and Condensed Matter, Arizona State University, Tempe, Arizona, March 22, (2024)

[39] Invited talk, High-harmonic Spectroscopy of Quantum Materials, APS March Meeting, March 3-8, (2024)

[38] Invited talk, Applying Attosecond Tools for Materials Study: Probing Topological Phase Transitions, C. Heide, Y. Kobayashi, T. Heinz, D. Reis, and S. Ghimire, The Winter Colloquium on the Physics of Quantum Electronics, January 6-10, (2024)

[37] Seminar, Strong-field Driven Processes in 2D Crystals and Topological Insulators, University of Rochester, October 19, (2024)

[36] Invited talk, Probing topological phase transition using high-order harmonic generation, International conference on attosecond science, ATTO9, Jeju Island, South Korea, July 9-14, 2023

[35] **A tutorial on high-order harmonic generation from solids,** Quantum battle, London, June 28-30, 2023

[34] Invited talk, Probing topological phase transition using high-order harmonic generation, Gordon research conference, May 28-June 2, 2023

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

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

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

[30] Invited talk, Fundamentals of high-harmonics from solids, ATTO 2019, July 1-5, 2019, Szeged, Hungary

[29] Colloquium, **Solids in strong laser fields**, 02/28/2019, University of California, Riverside

[28] Colloquium, **Solids in strong laser fields**, 01/15/2019, Georgia State University

[27] Colloquium, **New ultrafast probe for materials**, San Francisco State University, 10/01/2018

[26] Invited talk, First experiments in solid-state HHG, APS march meeting, Los Angeles, California 03/05/2018

[25] **Solids in strong field**, Special Seminar, Lawrence Berkeley National Lab, Berkeley, California, 02/02/2018

[24] **High-order harmonics from bulk and 2D crystals,** IEEE, Lake Buena Vista, Orlando, Florida, October 01/05/2017

[23] Colloquium, **Strong-field physics in dense media**, Kansas State University, Manhattan, KS, Sept 09/05/2017

[22]**High-order harmonics from bulk and 2D crystals**, European CLEO, Munich, Germany, 06/23-27/2017

[21]**Anisotropy in high harmonics from solids**, Physics of Quantum Electronics (PQE)-2017, Snowbird, Utah, 01/8-13/2017

[20]**Anisotropy in high-harmonics from bulk and 2D crystals**, DAMOP, Sacramento, CA, 2017

[19] **Strong-field processes in solids**, Lecture, University of Ottawa, Ottawa, Canada, 02/04/2015.

[18] **Wavelength scaled strong-field studies in solids**, Ultrafast X-ray Seminar, Lawrence Berkeley National Lab, Berkeley, CA, 03/15/2012.

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

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

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

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

[13]**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.

[12] **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.

[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).

10 Popular Press

[15] Floquet Engineering of Quantum Materials, Engrid Fadelli, Phys.org, January 20, 2023, link

[14] Exploring Quantum Electron Highways With Laser Light, Glennda Chui, SLAC today, August 18, 2022, link

[13] Investigating Topological Insulators with High Harmonics, Synopsis, Physics 14, s 18, by Erica Carlson, February 2, 2021

[12] In a First, Physicists Glimpse a Quantum Ghost, comment by Karmela Padavid-Callaghan, Scientific American, December 8, 2021link

[11] Circular Light Can Probe Topological Insulators, Optics and Photonics News, by Edwin Cartlidge, February 10, 2021

[10] 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 link

[9] My Journey: Dr. Shambhu Ghimire, published by ANPA-Global 2019 link

[8] Study Reports High-harmonic Generation In An Epsilon-near-zero Material, Ingrid Fadelli, Phys.org , August 15, 2019 link

[7] Nature photonics news and views, Locking the waveform with a quartz crystal, 12, 5, 256, 2018.

[6] A Potential New and Easy Way to Make Attosecond Laser Pulses: Focus A Laser On Ordinary Glass, SLAC Today, Glennda Chui, September 28, 2017 link

[5] New Tabletop Technique Probes Outermost Electrons of Atom Deep Inside Solids, Glennda Chui, SLAC Today, November 21, 2016 link

[4] Scientists Use A Frozen Gas to Boost Laser Light to New Extremes, Glennda Chui, SLAC Today, June 6, 2016 link

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

[2] News and views, High-harmonic Generation: Solid Progress, J. P. Marangos, Nature Physics, February 01, 2011

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

11 Peer-reviewed Journals

[53] C. Heide, Y. Kobayashi, S.R.U. Haque, and **S. Ghimire**, "Ultrafast high-harmonic spectroscopy of solids", Nature Phys 20, 1546-1557 (2024)

[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 Kelardeh, 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. Vaskivskyi, P. Thunstrm, **S. Ghimire**, R. Knut , J. Sderstrm , L. Kjellsson, D. Turenne, R. Y. Engel, M. Beye, J. Lu, A. H. Reid, W. Schlotter, G.Coslovich, M. Hoffmann, G. Kolesov, C. Schüler-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. Research 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 (2021)

[40] D. Baykusheva, A. Chacón, J. Lu, T. P. Bailey, J. A. Sobota, H. Soifer, P. S. Kirchmann, C. Rotundu, C. Uher, T. F. Heinz, D. A. 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, 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). *Associated news:*link

[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 attosecod 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).

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14 Scientific Organizations Membership:

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