Dr. Bahadur Singh

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Positions

07/2020-Present	Reader (Assitant Professor), Department of Condensed Matter Physics and Materials Science, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai 400005; India.
07/2019-06/2022	Affiliate Research Scientist at the Department of Physics, Northeastern University, Boston, Massachusetts, 02115; USA.
01/2018-12/2019	Postdoctoral Research Fellow at the SZU-NUS International Collaborative Laboratory of 2D Materials for Optoelectronic Science & Technology, College of Optoelectronic Engineering, Shenzhen University, Shenzhen 518060; China.
03/2019-06/2019	Visiting Scientist at the Department of Physics, Northeastern University, Boston, Massachusetts, 02115; USA
10/2015-12/2017	Postdoctoral Research Fellow at the Centre for Advanced 2D Materials and Graphene Research Centre, National University of Singapore, 117546; Singapore.
05/2015-09/2015	Project Scientist at the Department of Physics, Indian Institute of Technology, Kanpur, 208016; India.
09/2014-04/2015	Sr. Student Research Associate at the Department of Physics, Indian Institute of Technology, Kanpur, 208016; India.
12/2012	Visiting Scholar at the Department of Physics, Northeastern University, Boston, Massachusetts, 02115; USA,

Education

12/2009-05/2015	Ph.D. (Physics), Indian Institute of Technology, Kanpur, India. *Supervisor:* Prof. R. Prasad *Grade:* 9.33/10.00
2007-2009	M.Sc. (Physics), Himachal Pradesh University, Summer Hill, Shimla, India. Grade: 78.5% (First Class)
2004-2007	B.Sc. (Physics, Chemistry, Mathematics), Himachal Pradesh University, Shimla, India. *Grade:* 66.3% (First class)
2004	Intermediate (Physics, Chemistry, Mathematics), Central Board of Secondary Education, New Delhi, India. *Grade:* 77% (First class)
2002	Secondary school certificate (Science, Mathematics, Social Science), Central Board of Secondary Education, New Delhi, India. *Grade:* 78% (First class)

Awards

2014	Best oral presentation award at the International Conference on Condensed Matter Physics-2014 (ICCMP-2014), Shimla, India.
2014	Cash award from IIT Kanpur for publication in the journal listed at the ISI web of science (FY 2010-2011).
2013	Best paper award at the International Workshop on Computational Condensed Matter Physics-2013 (IWCCMP-2013), Gwalior, India.
2011	MHRD senior research fellowship (SRF) for research in India.
2009	MHRD junior research fellowship (JRF) for research in India.
2009	Elected in *GATE-2009* physics examination (Highest ranked national level examination for admission in IIT's and other research institutes of national importance in India).
2008	Qualified *CSIR-UGC NET* examination in December 2008 (Highest ranked national level skill test for fostering faculty and other higher ranked positions in India).

Research Experience

2015-Present	Electronic structure calculations, phonon calculations, and tight-binding modeling based on density functional theory (DFT) of Weyl semimetals, Dirac semimetals, Nodal-line semimetals, Topological insulators, Topological magnets, 2D novel materials as well charge density wave (CDW) and other phases in materials.
2009-2015	"First-principles investigations of topological phases in materials." This was my Ph.D. topic in which I studied bulk and surface electronic structures of several selected materials with a focus on delineating the topological band order and extract the topological surface state properties, using the *ab-initio* density functional theory framework and $\boldsymbol{k \cdot p}$ theory. I also predicted several new materials including thin-film materials, which demonstrate novel phenomena such as quantum spin Hall state, Dirac/Weyl semimetal or Rasbha effect.
2010 – 2011	"Structural and electronic properties of thallium based topological insulators". This was my PhD course work project under the supervision of Prof. R. Prasad at IIT Kanpur.
2009 – 2010	"Structural and electronic properties of TiO_2". This was my course work project under the supervision of Prof. R. Prasad at IIT Kanpur.

Research Interests and Highlights

The overarching goal of my research is to understand, predict, and engineer fundamental as well as functional physical properties of wide classes of materials ranging from topological Weyl, Dirac and Nodal-line semimetals, to topological insulators and Rasbha systems with focus on emergent properties arising from their combinations. I am also interested in understanding and engineering advanced materials with collective state phenomena and minimum physical dimensions that will be suitable for next-generation electronics and quantum information applications. I am enthusiastic about exploring new research areas including energy efficient

materials and materials relevant for green technologies of the future, building on and extending my research experience.

A few highlights of my research are as follows (see list of publications for details).

- We predicted, for the first time, several new Weyl semimetal candidates that are not limited to one material or a single family but realize various different types of emergent single Weyl fermions (I-breaking, T- breaking, type-I or type-II), and double-Weyl fermions, all using novel first-principles approaches. Following my theoretical predictions, LaAlGe has been confirmed experimentally as the first Weyl semimetal that hosts Lorentz-violating type II Weyl fermions, while Co_2MnGa has been confirmed as the first 3D topological magnet.

- We introduced the concept of "*Saddle-like topological surface states,*" and predicted several candidate materials for realizing this novel state, which would open up an exciting new generation of studies for addressing the interplay between topology and strong electron correlation physics.

- We introduced the concept of "*Topological Hopf and chain link semimetal states,*" and predicted magnetic Heusler Co_2MnGa as the first candidate material, which has been confirmed experimentally.

- We proposed "*3D hourglass semimetal state*" and predicted non-polar phase of charge ordered Ag_2BiO_3 as first candidate material to experimentally realize this state. Our study is the first to propose that Ag_2BiO_3 will provide an ideal platform for exploring the ferroelectric-semiconductor to Dirac-semimetal transition by the application of an external electric field.

- We predicted a novel quantum spin-Hall state in Ge-based thin films and $TlBiS_2$ thin films by either changing the thickness of the film or applying a transverse electric field. In addition, we demonstrated through ab-initio calculations that the thin films of $TlBiS_2$ can be switched from trivial to quantum spin Hall state and thus are viable candidates for realizing a gate-controlled on/off switch between the normal and quantum spin Hall state.

- We proposed new design methods for generating layered materials with varied quantum phases from the nonlayered materials using novel bottom up stragies. Tunable electronic, spintronic, and topological states were identified in these synthethic materials.

- Beyond the topological phases, we have predicted a stable charge density wave (CDW) phase in $TiSe_2$ monolayers. Through systematic calculations of the electronic and phonon spectrum based on density functional perturbation theory, we have demonstrated that electron-electron interactions and the excitonic instability arising from direct electron-hole coupling are pivotal for an accurate description of the CDW in this system. We have also developed theory of topological states in CDW materials.

Collaborations

I have published at least one paper with the following colleagues.

- Prof. A. Thamizavel (*TIFR Mumbai, India*)
- Prof. Kalobaran Maiti (*TIFR Mumbai, India*)
- Prof. R. Prasad (*IIT Kanpur, India*)
- Prof. Amit Agarwal (*IIT Kanpur, India*)
- Prof. Goutam Deo (*IIT Kanpur, India*)
- Prof. Zakir Hossain (*IIT Kanpur, India*)
- Prof. Sushil Auluck (*NPL, India*)
- Dr. Sudhir Husale (*NPL, India*)
- Dr. Bipin Gupta (*NPL, India*)

- Dr. V. P. S. Awana (*NPL, India*)
- Prof. Arun Bansil (*Northeastern University, Boston, USA*)
- Prof. Bernardo Barbiellini (*LUT University, Finland*)
- Prof. Hsin Lin (*Institute of Physics, Academia Sinica, Taiwan*)
- Prof. Robert S. Markiewicz (*Northeastern University, Boston, USA*)
- Prof. Zhiqiang Mao (*Penn State University, USA*)
- Prof. Fazel Tafti (*Boston College, USA*)
- Prof. Jianwei Sun (*Tulane University, USA*)
- Prof. Vitor M. Pereira (*Centre for Advanced 2D Materials, NUS, Singapore*)
- Prof. Chenliang Su (*Shenzhen University, China*)
- Prof. M. Z. Hasan (*Princeton University, USA*)
- Prof. Madhab Neupane *(University of Central Florida, USA)*
- Prof. Liang Fu (*MIT, Cambridge, USA*)
- Prof. Vidya Madhavan (*University of Illinois Urbana-Champaign, USA*)
- Prof. Guang Bian (*University of Missouri, USA*)
- Prof. Shin-Ming Huang (*National Sun Yat-Sen University, Taiwan*)
- Prof. Tay-Rong Chang (*National Cheng Kung University, Taiwan*)
- Prof. Shuang Jia (*Collaborative Innovation Center of Quantum Matter, Beijing, China*)
- Prof. Horng-Tay Jeng (*National Tsing Hua University, Taiwan*)
- Prof. Bent Weber (*NTU, Singapore*)
- Prof. Qi Jie Wang (*NTU, Singapore*)
- Prof. Titus Neupert (*University of Zurich, Switzerland*)
- Prof. Claudia Felser (*Max Planck Institute for Chemical Physics of Solids, Germany*)
- Prof. Vladimir N. Strocov (*Paul Scherrer Institute, Switzerland*)
- Prof. Ming-Chieh Lin (*Hanyang University, South Korea*).
- Carmine Autieri (*Polish Academy of Science, Poland*)

Editor of Journal

- Journal of Physics and Chemistry of Solids [ECEB]

Referee of Journals

- Physical Review Journals (PRL, PRB, and PRM)
- Nature Physics, Nature Materials
- Journal of Physics: Condensed Matter
- ACS Journals (The Journal of Physical Chemistry Letters, Applied Electronic Materials, Nano Letters)
- Advanced Materials
- Journal of Physics and Chemistry of Solids
- NPJ Scientific Reports
- Physica E: Low-dimensional Systems and Nanostructures

Numerical Techniques and Computational Skills

- We leverage various first-principles density functional theory-based codes and related methodologies, including VASP (Vienna ab-initio simulation package), which is a complex package that performs *ab-initio* quantum-mechanical molecular dynamics (MD) simulations using pseudopotentials or the projector-augmented wave method, Wien2K, Quantum Espresso and many other codes.
- We use the Phonopy code for modeling phonon spectra and Wannier90 for generating real space tight-binding model of materials. We have also developed our own codes for addressing various aspects of topological properties and Berry-curvature field effects of materials.

- We have developed a tool for unfolding band structures for addressing matrix element effects and circular dichroism in connection with modeling spectroscopies of the novel materials based on codes.
- We use Matlab extensively for programming as well for the analysis of first-principles results. We also use Mathematica, Fortran 90 and C for programming, among other scripting languages.

Teaching Experience

I believe students learn best when they are motivated to learn by seeing the value and importance of the information presented in the classroom. My teaching philosophy includes engaging and motivating students in learning fundamental physics to numerical simulation with a broad perspective on the underlying quest of science and technology.

07/2023-Present	Electronic Structure of Materials (Topical course)
07/2021-06/2022	Topological Band Theory (Advanced graduate level course)
07/2020-06/2021	Practical Methods of Electronic Structure Calculations (Short-term graduate course)
07/2022-Present	Practical Methods of Electronic Structure Calculations (Short-term graduate course)
07/2013-12/2014	Tutor in PHY102: Introduction to Mechanics (Three semesters) Tutor for PHY621: Electronic Structure of Materials.
07/2012-06/2013	Teaching assistant in PHY101 physics and preparatory lab for undergraduate students.
01/2010-06/2012	Teaching assistant in PHY461/462 M.Sc. physics lab for master student

Mentoring Experience

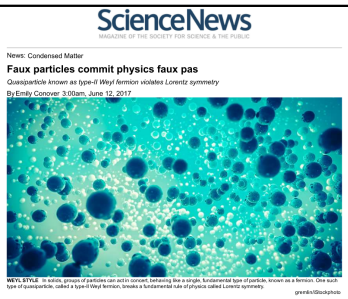
Ph.D. Scholar	2 (2 Ongoing)
Postdoc Fellows	3 (2 Ongoing, 1 Completed)
Visiting Students	4 (0 Ongoing, 4 Completed)

Professional Activities

2012-	Member of the American Physical Society (APS) and Material Research Society (MRS)
2016-	Member of the Materials Research Society Singapore (MRS-S)

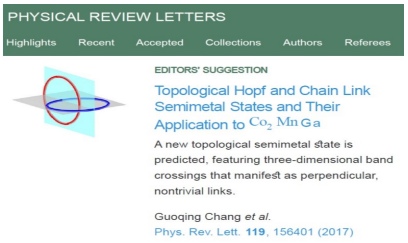
News Articles and Editors' Suggestion

1. *Discovery of Lorentz-violating type II Weyl fermions in LaAlGe*
Su-Yang Xu*, Nasser Alidoust*, Guoqing Chang*, Hong Lu*, **Bahadur Singh***, Ilya Belopolski, Daniel Sanchez, Xiao Zhang, Guang Bian, Hao Zheng, Marius-Adrian Husanu, Yi Bian, Shin-Ming Huang, Chuang-Han Hsu, Tay-Rong Chang, Horng-Tay Jeng, Arun Bansil, Vladimir N Strocov, Hsin Lin, Shuang Jia, M. Zahid Hasan (*equal contribution)
Science Advances **3**, e1603266 (2017)


ScienceNews
MAGAZINE OF THE SOCIETY FOR SCIENCE & THE PUBLIC
News: Condensed Matter
Faux particles commit physics faux pas
Quasiparticle known as type-II Weyl fermion violates Lorentz symmetry
By Emily Conover 3:00am, June 12, 2017
WEYL STYLE In solids, groups of particles can act in concert, behaving like a single, fundamental type of particle, known as a fermion. One such type of quasiparticle, called a type-II Weyl fermion, breaks a fundamental rule of physics called Lorentz symmetry.
gremlin/iStockphoto

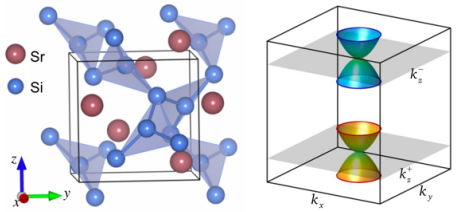
-News article in ScienceNews (Magazine for the society for science & the public); Magazine issue: Vol. 191, No. 13, July 8, 2017, p. 14 (https://www.sciencenews.org/article/faux-particles-commit-physics-faux-pas)

2. *Topological Hopf and Chain Link Semimetal States and Their Application to Co_2MnGa* Guoqing Chang, Su-Yang Xu, Xiaoting Zhou, Shin-Ming Huang,
Bahadur Singh, Baokai Wang, Ilya Belopolski, Jiaxin Yin, Songtian Zhang, Arun Bansil, Hsin Lin, and M. Zahid Hasan
Physical Review Letters **119**, 156401(2017)



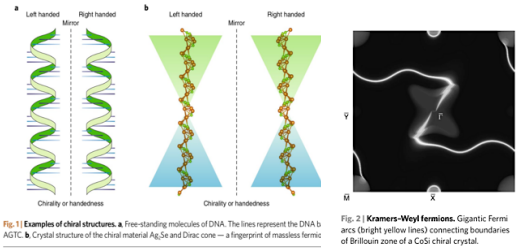
-Published Editors' Suggestion

3. *Tunable double-Weyl Fermion semimetal state in the $SrSi_2$ material class*
Bahadur Singh, Guoqing Chang, Tay-Rong Chang, S.-M. Huang, Chenliang Su, Ming-Chieh Lin, Hsin Lin, and Arun Bansil
NPJ Scientific Reports 8, 10540 (2018).



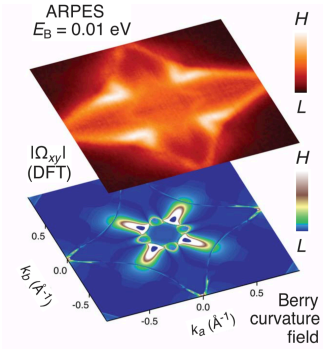
- Published Editor's Choice

4. *Topological quantum properties of chiral crystals*
Guoqing Chang, Benjamin J. Wieder, Frank Schindler, Daniel S. Sanchez, Ilya Belopolski, S.-M. Huang, **Bahadur Singh**, Di Wu, Tay-Rong Chang, Titus Neupert, Su-Yang Xu, Hsin Lin, and M. Zahid Hasan
Nature Materials **17**, 978 (2018).



-News and views in Nature Materials- *Chirality meets topology*, Nature Materials **17**, 953 (2018).

5. *Discovery of topological Weyl fermion lines and drumhead surface states in a room temperature magnet*
Ilya Belopolski, Kaustuv Manna, Daniel S Sanchez, Guoqing Chang, Benedikt Ernst, Jiaxin Yin, Songtian S Zhang, Tyler Cochran, Nana Shumiya, Hao Zheng, **Bahadur Singh**, Guang Bian, Daniel Multer, Maksim Litskevich, Xiaoting Zhou, Shin-Ming Huang, Baokai Wang, Tay-Rong Chang, Su-Yang Xu, Arun Bansil, Claudia Felser, Hsin Lin, M Zahid Hasan
Science **365**, 1278 (2019).

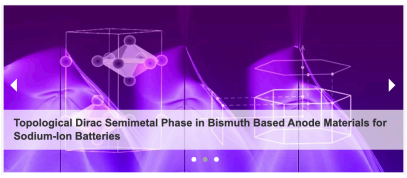


-Science PERSPECTIVE- *"Weyl"ing away time-reversal symmetry,* Science **365**, 1248 (2019).

6. *Optical detection and manipulation of spontaneous gyrotropic electronic order in a transition-metal dichalcogenide semimetal*
Su-Yang Xu, Qiong Ma, Y. Gao, A. Kogar, Guo Alfred Zong, Andres M. Mier Valdivia, T. H. Dinh, Shin-Ming Huang, **Bahadur Singh**, J. P.C. Ruff, K. Watanabe, Takashi Taniguchi, Hsin Lin, Di Xiao, Goran Karapetrov, Pablo Jarillo-Herrero, and Nuh Gedik
Nature **578**, 545 (2020).

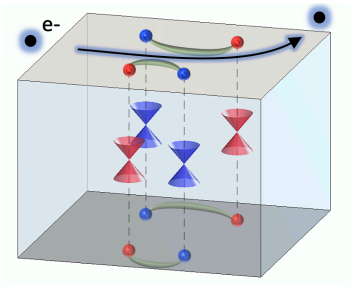
-Published as a Cover Story in Nature
-News and Blogs (https://www.nature.com/articles/s41586-020-2011-8/metrics)

7. *Topological Dirac semimetal phase in bismuth-based anode materials for sodium-ion batteries*
Wei-Chi Chiu*, **Bahadur Singh*,** Sougata Mardanya, Johannes Nokelainen, Amit Agarwal, Hsin Lin, Christopher Lane, Katariina Pussi, Bernardo Barbiellini, and Arun Bansil (*corresponding author)
Condensed Matter **5**, 39 (2020).



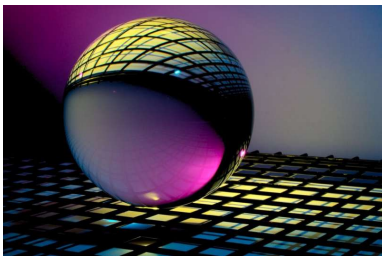
-Published as a Cover Story in Condensed Matter (MDPI)

8. *Noncollinear ferromagnetic Weyl semimetal with anisotropic anomalous Hall effects*
Hung-Yu Yang*, **Bahadur Singh***, Jonathan Gaudet, Baozhu Lu, Cheng-Yi Huang, Wei-Chi Chiu, Shin-Ming Huang, Baokai Wang, Faranak Bahrami, Bochao Xu, Jacob Franklin, Ilya Sochnikov, David E. Graf, Guangyong Xu, Yang Zhao, Christina M. Hoffman, Hsin Lin, Darius H. Torchinsky, Collin L. Broholm, Arun Bansil, and Fazel Tafti (*equal contribution)
Physical Review B **103**, 115143 (2021)



-Published Editors' Suggestion

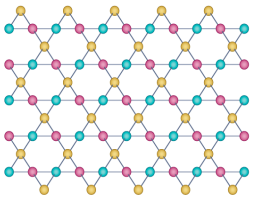
9. *Layer Hall effect in a 2D topological axion antiferromagnet*
Anyuan Gao,.. **Bahadur Singh**, *et al.*
Nature **595**, 521 (2021).

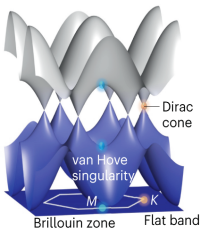


-News and Blogs (https://www.nature.com/articles/s41586-021-03679-w/metrics)

10. *Rotation rearranges electrons*
Bahadur Singh
Nature Physics **19**, 1757 (2023) [Online].

- https://www.nature.com/articles/s41567-023-02237-7





Summary of Publications

Total Number of Publications: 99 (Published: 90, Under Consideration: 9)
Publications (Since July 2020): 61 (Published: 52, Under Consideration: 9)

Notable Publications: 2 Science, 2 Nature, 2 Nature Materials, 1 Nature Physics, 1 Advanced Materials, 1 Science Advances, 1 Nature Communications, 3 NPJ Communications Physics, 1 Nano Letters, 1 APL Materials, 4 Physical Review Letters, 1 Physical Review X, 34 Physical Review B, 5 Physical Review Materials, 3 Physical Review Research

Total citations are 3668 with an H-index of 26 from Google Scholars (19/12/2023)

Peer-reviewed Journal Papers

Year 2023

1. Bikash Patra, Rahul Verma, Shin-Ming Huang, **Bahadur Singh***, *Role of effective mass anisotropy in realizing a hybrid nodal-line fermion state* (*corresponding author)
Physical Review B **108**, 235136 (2023). DoP: 12 December 2023

2. Yanglin Zhu, Cheng-Yi Huang, Yu Wang, David Graf, Hsin Lin, Seng Huat Lee, John Singleton, Lujin Min, Johanna C. Palmstrom, Arun Bansil, **Bahadur Singh***, Zhiqiang Mao, *Surprisingly large anomalous Hall effect and giant negative magnetoresistance in half-topological semimetals* (*corresponding author)
NPJ Communications Physics **06**, 346 (2023). DoP: 29 November 2023

3. Rahul Verma, Bikash Patra, **Bahadur Singh***, *Topological nonsymmorphic insulator versus Dirac semimetal in KZnBi* (*corresponding author)
Electronic Structure **05**, 045011 (2023). DoP: 27 November 2023

4. Sabin Regmi, Cheng-Yi Huang, M. A Khan, Baokai Wang, A. P. Sakhya, Md M. Hosen, J. Thompson, **Bahadur Singh**, J. D Denlinger, M. Ishigami, J. Mitchell, D. Kaczorowski, A. Bansil, M. Neupane, *Electronic structure in a transition metal dipnictide $TaAs_2$*
Journal of Physics: Condensed Matter **36**, 075502 (2023). DoP: 14 November 2023

5. **Bahadur Singh***, *Rotation rearranges electrons* (*corresponding author)
Nature Physics **19**, 1757 (2023). **[Invited News and Views]**. DoP: 19 October 2023

6. Robert S. Markiewicz, **Bahadur Singh***, Christopher Lane, Arun Bansil, *Investigating the Cuprates as a platform for high-order Van Hove singularities and flat-band physics* (*corresponding author)
NPJ Communications Physics **6**, 292 (2023). DoP: 13 October 2023

7. Tugrul Hakioglu, Wei-Chi Chiu, Robert S. Markiewicz, **Bahadur Singh**, A. Bansil, *Nonorthogonal spin-momentum locking*
Physical Review B **108**, 155103 (2023). DoP: 3 October 2023

8. Vikas Saini, A. Punjal, Utkarsh Kumar Pandey, Ruturaj Vikrant Puranik, Vikash Sharma, Vivek Dwij, K. Vijay, R. Kulkarni, S. Banik, A. Dharmadhikari, **Bahadur Singh**, S. Prabhu, A. Thamizhavel, *Ultrafast Carrier Relaxation and Second Harmonic Generation in a Higher-Fold Weyl Fermionic System PtAl*
Advanced Physics Research 2300063 (2023). DoP: 2 October 2023

9. Rajibul Islam, Ghulam Hussain, Rahul Verma, Mohammad Sadegh Talezadehlari, Zahir Muhammad, **Bahadur Singh***, Carmine Autieri, *Fast electrically switchable large gap quantum spin Hall states in MGe_2Z_4* (*corresponding author)
Advanced Electronic Materials 202300156 (2023). DoP: 16 June 2023

10. Anyuan Gao, Yu-Fei Liu, J.-X. Qiu, Barun Ghosh, T. V. Trevisan, Y. Onishi, C. Hu, T. Qian, H.-Ju Tien, S.-W. Chen, M. Huang, D. Bérubé, H. Li, C. Tzschaschel, T. Dinh, Z. Sun, S.-C. Ho, S.-Wei Lien, **Bahadur Singh**, K. Watanabe, T. Taniguchi, D. C Bell, H. Lin, T-R. Chang, C. R. Du, A. Bansil, L. Fu, Ni Ni, P P Orth, Qiong Ma, Su-Yang Xu, *Quantum metric nonlinear Hall effect in a topological antiferromagnetic heterostructure*
Science **381**, 181 (2023). DoP: 15 June 2023

11. Gourav Dwari, Souvik Sasmal, Shovan Dan, Bishal Maity, Vikas Saini, Ruta Kulkarni, Soma Banik, Rahul Verma, **Bahadur Singh**, and Arumugam Thamizhavel, *Large unsaturated magnetoresistance and electronic structure studies of single-crystal GdBi*
Physical Review B **107**, 235117 (2023). DoP: 08 June 2023

12. Anup Pradhan Sakhya, Cheng-Yi Huang, Gyanendra Dhakal, Xue-Jian Gao, Sabin Regmi, Baokai Wang, Wei Wen, R. -H. He, Xiaohan Yao, Robert Smith, Milo Sprague, Shunye Gao, **Bahadur Singh**, Hsin Lin, Su-Yang Xu, Fazel Tafti, Arun Bansil, and Madhab Neupane, *Observation of Fermi arcs and Weyl nodes in a non-centrosymmetric magnetic Weyl semimetal*
Physical Review Materials **07**, L051202 (2023). DoP: 16 May 2023

13. Sitaram Ramakrishnan, Shidaling Matteppanavar, Andreas Schönleber, Bikash Patra, Birender Singh, Arumugam Thamizhavel, **Bahadur Singh***, Srinivasan Ramakrishnan, Sander van Smaalen, *Realization of Z_2 Topological Metal in Single-Crystalline Nickel Deficient NiV_2Se_4* (*corresponding author)
Annalen der Physick **535**, 2200611 (2023). DoP: 09 May 2023

14. Hung-Yu Yang, Jonathan Gaudet, Rahul Verma, Santu Baidya, F. Bahrami, Xiaohan Yao, Cheng-Yi Huang, L. D.B.-Schmitt, A. A. Aczel, G. Xu, Hsin Lin, Arun Bansil, **Bahadur Singh**, and Fazel Tafti, *Stripe helical magnetism and two regimes of anomalous Hall effect in NdAlGe*
Physical Review Materials **07**, 034202 (2023). DoP: 27 March 2023

15. Pushpendra Yadav, Bramhachari Khamari, **Bahadur Singh**, K. V. Adarsh, Amit Agarwal, *Fluence dependent dynamics of excitons in monolayer $MoSi_2Z_4$ (Z= pnictogen)*
Journal of Physics: Condensed Matter **35**, 235701 (2022). DoP: 27 March 2023

16. Xiaohan Yao Jonathan Gaudet, Rahul Verma, David E Graf, Hung-Yu Yang, Faranak Bahrami, Ruiqi Zhang, Adam A Aczel, Sujan Subedi, Darius H Torchinsky, Jianwei Sun, Arun Bansil, Shin-Ming Huang, **Bahadur Singh**, Predrag Nikolic, Peter Blaha, Fazel Tafti, *Topological spiral magnetism in the Weyl semimetal SmAlSi*
Physical Review X **13**, 011035 (2023). DoP: 9 March 2023

17. J.-X. Qiu, C. Tzschaschel, J. Ahn, A. Gao, H. Li, X.-Y. Zhang, B. Ghosh, C. Hu, Y.-X. Wang, Y.-F. Liu, D. Berube, T. Dinh, Z. Gong, S.-W. Lien, S.-C. Ho, **Bahadur Singh**, Kenji Watanabe,T. Taniguchi, D. C. Bell, H.-Z. Lu, A. Bansil, H. Lin, T.-R. Chang, B. B. Zhou, Q. Ma, Ashvin Vishwanath, Ni Ni, and Su-Yang Xu, *Axion optical induction of antiferromagnetic order*
Nature Materials **22**, 583 (2023). DoP: 09 March 2023

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89. Sawani Datta, K. Ali, Rahul Verma, **Bahadur Singh**, S. P. Dash, A. Thamizhavel, Kalobaran Maiti, *Evidence of electron correlation induced kink in Dirac bands in a non-symmorphic Kondo lattice system, $CeAgSb_2$*
Physical Review B (2023). Preprint at arXiv:2311.05278

90. Sougata Mardanya, Mehdi Kargarian, Rahul Verma, Tay-Rong Chang, Sugata Chowdhury, Hsin Lin, Arun Bansil, Amit Agarwal, **Bahadur Singh***, *Unconventional superconducting pairing in a B20 Kramers Weyl semimetal* (*corresponding author)
Physical Review Letters (2023). Preprint at arXiv:2309.05880

91. Jing-Yang You, Xiaoting Zhou, Tao Hou, M. Yahyavi, Yuanjun Jin, Yi-Chun Hung, **Bahadur Singh**, Chun Zhang, Jia-Xin Yin, Arun Bansil, Guoqing Chang, *Topological chiral kagome lattice*
Physical Review Letters (2023). Preprint at arXiv:2309.00217

92. N. Singh Mehta, Bikash Patra, G. Mohmad, M. Garg, P. Bhardwaj, P K Meena, K Motla, R. P. Singh, **Bahadur Singh**, Goutam Sheet, *Topological surface states host superconductivity induced by the bulk condensate in $YRuB_2$*
Physical Review Letters (2023). Preprint at arXiv:2309.08308

93. Robert S. Markiewicz, **Bahadur Singh***, Christopher Lane, Arun Bansil, *Evolution of high-order Van Hove singularities away from cuprate-like band dispersions and its implications for cuprate superconductivity* (*corresponding author)
NPJ Communications Physics (2023). Preprint at arXiv:2303.06520

94. Vikas Saini, Bikash Patra, **Bahadur Singh**, A. Thamizhavel, *Coexistence of phononic Weyl, nodal line, and threefold excitations in chalcopyrite $CdGeAs_2$ and associated thermoelectric properties*
Physical Review B (2023). Preprint at arXiv:2301.00635.

95. Ruiqi Zhang, Christopher Lane, Johannes Nokelainen, **Bahadur Singh**, Bernardo Barbiellini, Robert S Markiewicz, Arun Bansil, Jianwei Sun, *Fingerprints of nematicity and competing orders in the infinite-layer nickelate*
Nature Communications (2022). Preprint at arXiv:2207.00184

96. Wei-Chi Chiu, Sougata Mardanya, Robert Markiewicz, Jouko Nieminen, **Bahadur Singh**, Tugrul Hakioglu, Amit Agarwal, Tay-Rong Chang, Hsin Lin, and Arun Bansil, *Topological charge density wave in monolayer $NbSe_2$*
NPJ Communications Physics (2021). Preprint at arXiv:2104.14634

Peer-reviewed Conference Papers

97. **Bahadur Singh** and R. Prasad, *Spin-texture of the non-trivial surface state of topological insulator Sb_2Te_3*
Quantum Matter **5**, 362 (2016).

98. **Bahadur Singh** and R. Prasad, *Orbital selective spin-texture in a topological insulator*
AIP Conf. Proc. **1661**, 110022 (2015).

99. **Bahadur Singh** and R. Prasad, Termination-dependent *surface states and spin-arrangement on the surface of a topological insulator*
International Conference on Materials, Energy and Environments (ICMEE) series.

Invited Talks/Seminars

1. *Nature of nodal fermion states in anisotropic lattice materials,*
TIFR Condensed-Matter Physics Conference, TIFR Hyderabad, December 2023

2. *Mapping between symmetry, property, and topology in materials*
International conference on emerging phenomena in quantum materials, Bharatpur, India [by Uppsala University, Sweden & SPPU Pune], December 2023

3. *Understanding lattice geometry-driven energy dispersion in topological materials,*
Annual Conference on Quantum Condensed Matter (QMAT2023), NISER Bhubaneswar India, November 2023

4. *Local structural motifs driven topological electronic states in quantum materials*
New Approaches and Machine learning Methods for Ab initio calculations: NAMMA Psi-k Workshop

IISc & JNCASR, Bangalore, July 2023

5. *Theoretical design of atomically thin materials with topological twists*
RTCMP2023, IACS Kolkata, West Bengal, India, January 2023

6. *Designing atomically thin materials with switchable electronic and topological states*
Emergent phenomena in van der Waals Heterostructures, TIFR Mumbai, India, January 2023

7. *Superconductivity in chiral multifold fermion metal RhGe*
SNS2022, Indian Institute of Science, Bangalore, India, December 2022

8. *Bottom-up synthesized atomically thin materials with switchable electronic and topological states*
NCES 2022, Goa University, Goa, India, November 2022

9. *Symmetry, Topology, and Electronic structure of Quantum Materials*
Colloquium at CSIR-National Physical Laboratory New Delhi, India, September 2022

10. *Tunable Dirac and Weyl fermion states in $SrIn_2As_2$ class of Zintl materials*
ICTCMS 2022, S. N. Bose National Centre for Basic Sciences, Kolkata, India, February 2022

11. *Topological quantum magnets: From concept to material realizations*
65th DAE-SSPS 2021, BARC Mumbai, India, December 2021

12. *Magnetically controlled nontrivial states in topological materials*
QMAT-2021, TIFR Mumbai, India, December 2021

13. *Topology, Symmetry, and Magnetism in Quantum Materials*
YIMQCMT-2021, NISER Bhubaneswar, India, November 2021

14. *Dirac, Weyl, and higher-fold fermions in topological quantum materials*
ICMSAP-2021, Pachhunga College Mizoram University, India, November, 2021

15. *Materials Discovery for Realizing Chiral Majorana as Qubit*
QIS Team Meeting, Northeastern University Boston, USA, June 2020

16. *Quantum Materials: Transformational Opportunities for Fundamental Science and Applications*
DCMPMS, Tata Institute of Fundamental Research, Mumbai, India, August 2019

17. *Exotica of Topological Materials: From Insulators to Semimetals and Superconductors*
DCMPMS, Tata Institute of Fundamental Research, Mumbai, India, August 2019

18. *Exotic saddle-like topological surface states in ZrPtGe materials family*
Institute of Physics, Academia Sinica, Taipei, Taiwan, June 2018

19. *Topological semimetals prediction using first-principles calculations*
The 16th Workshop on First-Principles Computational Materials Physics, National Center for Theoretical Sciences (NCTS), Hsinchu, Taiwan, June 2018

20. *Topological materials and 2D thin films beyond graphene*
Department of Physics, Himachal Pradesh University Shimla, India, March 2018

21. *Theoretical modelling of 2D materials and topological insulators*
ICL2DMOST, College of Optoelectronic Engineering, Shenzhen University, China, January 2018

22. *Topological Semimetals and 2D materials*
CA2DM, National University of Singapore, Singapore, August 2017.

23. *Topological Materials: From Insulators to Semimetals*
Department of Physics, Indian Institute of Technology Kanpur, India, April 2017.

24. *Discovery of first type-II Weyl fermion semimetal state in LaAlGe materials*
Department of Physics, Indian Institute of Technology Kanpur, India, February 2017.

25. *Discovery of topological insulator and Weyl semimetal state in $TlBiSe_2$ and LaAlGe class of materials*
Institute of Nano Science and Technology, Mohali, India, February 15, 2017.

26. *Topological insulator and quantum spin Hall state in $TlBiSe_2$ class of ternary semiconductors*
EMN Meeting on Quantum, Phuket, Thailand, April 2016.

Contributed Talks

27. *Stripe Helical Magnetism and Two Regimes of Anomalous Hall Effect in NdAlGe,* Hung-Yu Yang, Jonathan Gaudet, Rahul Verma, Santu Baidya, Faranak Bahrami, Xiaohan Yao, Cheng-Yi Huang, Lisa M DeBeer-Schmitt, Adam A Aczel, Guangyong Xu, Hsin Lin, Arun Bansil, **Bahadur Singh**, Fazel Tafti American Physical Society March Meeting, Las Vegas, Nevada 2023

28. *Negligible Hall resistance in Dirac semimetal $EuCu_2Sb_2$*, Souvik Sasmal, Bikas Patra, Kritika Vijay, Gourav Dwari, Bishal Maity, Vikas Saini, Soma Banik, **Bahadur Singh**, Arumugam Thamizhavel, American Physical Society March Meeting, Las Vegas, Nevada 2023

29. *Complex electronic structure evolution in a rare-earth based monopnic*tide, Anup Pradhan Sakhya, Baokai Wang, Firoza Kabir, Cheng-Yi Huang, Md Mofazzel Hosen, **Bahadur Singh**, Sabin Regmi, Gyanendra Dhakal, Klauss Dimitri, Milo Sprague, Robert Smith, Eric Bauer, Filip Ronning, Arun Bansil, Madhab Neupane, American Physical Society March Meeting, Las Vegas, Nevada 2023

30. *Electronic structure of a non-symmorphic Kondo lattice system $CeAgSb_2$*, Sawani Datta, Khadiza Ali, Rahul Verma, Arumugam Thamizhavel, **Bahadur Singh**, Kalobaran Maiti, American Physical Society March Meeting, Las Vegas, Nevada 2023

31. *Competing stripe phases in the undoped infinite-layer nickelate*, Ruiqi Zhang, Christopher Lane, Johannes Nokelainen, **Bahadur Singh**, Bernardo Barbiellini, Robert Markiewicz, Arun Bansil, Jianwei Sun, American Physical Society March Meeting, Las Vegas, Nevada 2023

32. *Strain engineering of quantum geometry in magnetic topological insulators*, Barun Ghosh, Sugata Chowdhury, Tay-Rong Chang, Hsin Lin, **Bahadur Singh**, Suyang Xu, Arun Bansil, American Physical Society March Meeting, Las Vegas, Nevada 2023

33. *Observation of Fermi arcs and Weyl nodes in a non-centrosymmetric magnetic Weyl semimetal*, M. Islam Mondal, Anup Pradhan Sakhya, Cheng-Yi Huang, Gyanendra Dhakal, Xuejian Gao, Sabin Regmi, B. Wang, W. Wen, R-H He, Xiaohan Yao, Robert Smith, Milo Sprague, Shunye Gao, **Bahadur Singh**, Hsin Lin, Suyang Xu, Fazel Tafti, Arun Bansil, Madhab Neupane, American Physical Society March Meeting, Las Vegas, Nevada 2023

34. Anomalous transport properties of Weyl semimetal CeAlSi, Md Alam, Amar Fakhredine, Mujeeb Ahmed, Pardeep Tanwar, Hung Yang, Fazel Tafti, Giuseppe Cuono, Rajibul Islam, **Bahadur Singh**,

Artem Lynnyk, Carmine Autieri, Marcin Matusiak, American Physical Society March Meeting, Las Vegas, Nevada 2023

35. Engineering an axion insulator phase in superlattices without inversion symmetry, Rajibul islam, Sougata Mardanya, Alexander Lau, G. Cuono, Tay-Rong Chang, M. S. Bahramy, **Bahadur Singh**, Carlo M Canali, Tomasz Dietl, Carmine Autieri, American Physical Society March Meeting, Las Vegas, Nevada 2023

36. Realizing Dirac and Weyl fermions in magnetically tunable Zintl materials, Sougata Mardanya, Barun Ghosh, C.-Y. Huang, Shin-Ming Huang, Hsin Lin, Tay-Rong Chang, Sugata Chowdhury, Arun Bansil, **Bahadur Singh**, American Physical Society March Meeting, Las Vegas, Nevada 2023

37. Cuprate-Specific Modeling of Pseudogap Collapse, Robert Markiewicz, **Bahadur Singh**, Christopher Lane, Arun Bansil, American Physical Society March Meeting, Las Vegas, Nevada 2023

38. *High order Van Hove singularities and flat bands*, Robert Markiewicz, **Bahadur Singh**, Christopher Lane, Arun Bansil. American Physical Society March Meeting, Chicago, Illinois 2022

39. *Observation of Quantum Hall Effect and Charge Density Wave in CaCu4As2 single crystal*, Souvik Sasmal, Vikas Saini, Sitaram Ramakrishnan, Gourav Dwari, Bishal Maity, Jinke Bao, Rajib Mondal, Vikram Tripathi, **Bahadur Singh**, A Thamizhavel, American Physical Society March Meeting, Chicago, Illinois 2022

40. *Tuning the Exotic Quantum Phase of EuA_2X_2 (A = Cd, Zn, Mg, Sb; X = As, P) by using Chemical substitution*, G. Alqasseri, Barun Ghosh, Arun Bansil, Fazel Tafti, **Bahadur Singh**, Sugata Chowdhury, American Physical Society March Meeting, Chicago, Illinois 2022

41. *Magnetic, f-electron, and hole doping effects in infinite-layer nickelates*, Ruiqi Zhang, Christopher Lane, **Bahadur Singh**, Johannes Nokelainen, Matthew Matzelle, Bernardo Barbiellini, Robert Markiewicz, Arun Bansil, Jianwei Sun. American Physical Society March Meeting, Chicago, Illinois 2022

42. *Weyl-node-driven domain wall motion and collective magnetism in double-symmetry-breaking Weyl semimetals*, Hung-Yu Yang, Fazel Tafti, **Bahadur Singh**, Arun Bansil, J. Gaudet, Collin Broholm, Santu Baidya, David Vanderbilt, Predrag Nikolic, Baozhu Lu, Darius Torchinsky, Cheng-Yi Huang, Hsin Lin, Bochao Xu, Ilya Sochnikov, David Graf. American Physical Society March Meeting, Chicago, Illinois 2022

43. *Collective plasmonic modes in the chiral multifold fermionic material Co*Si, Barun Ghosh, Debasis Dutta, **Bahadur Singh**, Hsin Lin, Antonio Politano, Arun Bansil, Amit Agarwal. American Physical Society March Meeting, Chicago, Illinois 2022

44. *Observation of a Smoothly Tunable Dirac Point in $Ge(Bi_xSb_{1-x})_2Te_4$*, Arjun Raghavan, Sean Howard, A. Raghavan, Davide Iaia, Caizhi Xu, David Flototto, Man-Hong Wong, Sung-Kwan Mo, **Bahadur Singh**, Raman Sankar, Hsin Lin, Tai-Chang Chiang, Vidya Madhavan. American Physical Society March Meeting, Chicago, Illinois 2022

45. *Fermi surface studies of YSi from dHvA oscillations and first principles calculations*, Vikas Saini, Souvik Sasmal, **Bahadur Singh**, A Thamizhavel. American Physical Society March Meeting, Chicago, Illinois 2022

46. *Electronic structure of a new magnetic Weyl semimetal candidate CeAlSi by using ARPES*, Anup Pradhan Sakhya, Gyanendra Dhakal, Cheng-Yi Huang, Sabin Regmi, Hsin Lin, **Bahadur Singh**, Fazel

Tafti, Arun Bansil, Madhab Neupane. American Physical Society March Meeting, Chicago, Illinois 2022

47. *Strain-induced topological charge density wave in monolayer $NbSe_2$*, Wei-Chi Chiu, Sougata Mardanya, Robert Markiewicz, Jouko Nieminen, **Bahadur Singh**, Tugrul Hakioglu, Amit Agarwal, Tay-Rong Chang, Hsin Lin, Arun Bansil. American Physical Society March Meeting, Chicago, Illinois 2022

48. *Topological Antiferromagnetic Phase of Ni-Intercalated Bi2Te3 in Sputtered Topological Insulator/Ferromagnet-Bi2Te3/Ni80Fe20 Heterostructures*, Nirjhar Bhattacharjee, K. Mahalingam, Adrian Fedorko, Valeria Lauter, Matthew Matzelle, **Bahadur Singh**, Alexander Grutter, Alexandria Will-Cole, Michael Page, Michael McConney, Robert Markiewicz, Arun Bansil, Donald Heiman, Nian Sun. American Physical Society March Meeting, Chicago, Illinois 2022

49. *Magnetic and Interfacial Characteristics of CMOS Compatible Sputtered Topological Insulator/Ferromagnet Heterostructures*, Nirjhar Bhattacharjee, K. Mahalingam, Adrian Fedorko, Valeria Lauter, Matthew Matzelle, **Bahadur Singh**, Alexander Grutter, Alexandria Will-Cole, Michael Page, Michael McConney, Robert Markiewicz, Arun Bansil, Donald Heiman, Nian Sun. American Physical Society March Meeting, Chicago, Illinois 2022

50. *Ferromagnetic Weyl semimetals and their electromagnetic response in RAlX materials class (R= Ce or Pr and X = Si or Ge),* Cheng-Yi Huang, **Bahadur Singh**, Hung-Yu Yang, Jonathan Gaudet, Baozhu Lu, Wei-Chi Chiu, Shin-Ming Huang, Baokai Wang, Faranak Bahrami, Bochao Xu, J. Franklin, I. Sochnikov, D. E. Graf, Guangyong Xu, Yang Zhao, Christina M. Hoffman, Hsin Lin, Darius H. Torchinsky, Collin L. Broholm, Arun Bansil, and Fazel Tafti, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

51. *Unconventional anomalous Hall effect in a new noncollinear ferromagnetic Weyl semimetal CeAlSi with Tunable Fermi Level,* Hung-Yu Yang, **Bahadur Singh**, Hung-Yu Yang, Jonathan Gaudet, Baozhu Lu, Cheng-Yi Huang, Wei-Chi Chiu, Shin-Ming Huang, Baokai Wang, Faranak Bahrami, Bochao Xu, J. Franklin, I. Sochnikov, D. E. Graf, Guangyong Xu, Yang Zhao, Christina M. Hoffman, Hsin Lin, Darius H. Torchinsky, Collin L. Broholm, Arun Bansil, and Fazel Tafti, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

52. *Topological Chiral Semimetal: theory and experiments*, Guoqing Chang , Daniel S. Sanchez Ilya Belopolski, Tyler Cochran, Benjamin Wieder, Frank Schindler, Jiaxin Yin, Songtian Zhang, Shin-Ming Huang, **Bahadur Singh**, Tay-Rong Chang, Arun Bansil, Titus Neupert, Suyang Xu, Hsin Lin, and Zahid Hasan, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

53. *Theoretical prediction of a two-dimensional in-plane antiferromagnetic insulator*, Anan Bari Sarkar, Barun Ghosh, **Bahadur Singh**, Somnath Bhowmick, Hsin Lin, Arun Bansil, and Amit Agarwal, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

54. *Non-orthogonal spin-momentum locking in strongly spin-orbit coupled materials*, Wei-Chi Chiu, Tugrul Hakiogolu, Robert Markiewicz, **Bahadur Singh**, and Arun Bansil, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

55. *Super Van Hove singularities in cuprate high-Tc superconductors*, Robert Markiewicz, **Bahadur Singh**, C. Lane, and Arun Bansil, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

56. *Accurate lattice dynamics of cuprates from first principles*, Jinliang Ning, C. Lane, Matthew Matzelle, **Bahadur Singh**, Bernardo Barbiellini, Robert Markiewicz, Arun Bansil, and Jianwei Sun, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

57. *Electronic structure study of rare-earth monopnictide DySb*, Klauss Dimitri, Md Mofazzel Hosen, Gyanendra Dhakal, Baokai Wang, Firoza Kabir, Christopher Sims, Sabin Regmi, **Bahadur Singh**, Anan Sarkar, Amit Agarwal, Eric D Bauer, Filip Ronning, Arun Bansil, and Madhab Neupane, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

58. *Correlation-driven super Van Hove singularity in slow graphene*, Baokai Wang, **Bahadur Singh**, Hsin Lin, Robert Markiewicz, and Arun Bansil, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

59. *Saddle-point von Hove singularity and dual topological insulator state in Pt_2HgSe_3,* Barun Ghosh, Sougata Mardanya, **Bahadur Singh**, Baokai Wang, Xiaoting Zhou, Tay-Rong Chang, Chenliang Su, Hsin Lin, Amit Agarwal, and Arun Bansil, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

60. *Temperature Dependent Electronic Structure in a Higher Order Topological Insulator Candidate $EuIn_2As_2$,* Sabin Regmi, M. Mofazzel Hosen, Barun Ghosh, **Bahadur Singh**, Gyanendra Dhakal, Christopher Sims, Baokai Wang, Firoza Kabir, K. Dimitri, Yangyang Liu, Amit Agarwal, Hsin Lin, D. Kaczorowski, Arun Bansil, and Madhab Neupane, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

61. *Understanding the quantum oscillation spectrum of heavy-fermion compound SmB_6,*Ruiqi Zhang, **Bahadur Singh**, Christopher Lane, Jamin kidd, Yubo Zhang, Bernardo Barbiellini Robert Markiewicz, Arun Bansil and Jianwei Sun, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

62. *Ab initio description of the $Bi_2Sr_2CaCu2O_{8+d}$ electronic structure*, Johannes Nokelainen, Christopher Lane, Robert Markiewicz, Bernardo Barbiellini, Aki Pulkkinen, **Bahadur Singh**, Jianwei Sun, Katariina Pussi, Arun Bansil, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

63. *Weak antilocalization and quantum hall effect in bulk CaCuSb single crystal*, Souvik Sasmal, Rajib Mondal, Ruta Kulkarni, Vikaram Tripathi, Bahadur Singh, Arumugam Thamizhavel, American Physical Society March Meeting, Virtual USA Daylight Time, March 2021

64. *Topological hourglass Dirac semimetal in Ag_2BiO_3,* **Bahadur Singh**, Barun Ghosh, Chenliang Su, Hsin Lin, Amit Agarwal, Arun Bansil. American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

65. *Clarification of charge-density wave gap symmetry and topology in bulk 1T-$TiSe_2$,* Shin-Ming Huang, Suyang Xu, **Bahadur Singh**, Ming-Chien Hsu, Chuang-Han Hsu, Chenliang Su, Arun Bansil, and Hsin Lin, American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

66. *A new topological crystalline insulator state in the $TaAs_2$ materials class,* Baokai Wang, Barun Ghosh, Wei-Chi Chiu, **Bahadur Singh**, Chenliang Su, Amit Agarwal, Hsin Lin, and Arun Bansil. American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

67. *Unified microscopic description of the origin and interplay between CDW and superconducting order in $TiSe_2$*, Vitor Pereira, Chuan Chen, Lei Su, **Bahadur Singh**, Antonio Helio Castro Neto, and Hsin Lin, American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

68. *Observation of surface Dirac dispersion in transition metal dipnictides,* Gyanendra Dhakal, Md Mofazzel Hosen, Wei-Chi Chiu, **Bahadur Singh**, Klauss Dimitri, Baokai Wang, Firoza Kabir, Christopher Sims, Sabin Regmi, Hsin Lin, Dariusz Kaczorowski, Arun Bansil, and Madhab Neupane American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

69. *Comparative first-principles study of a prototypical Dirac semimetal by GGA and SCAN meta-GGA energy functionals*, Wei-Chi Chiu, **Bahadur Singh**, Johannes Nokelainen, Chenliang Su, Hsin Lin, Bernardo Barbiellini, and Arun Bansil. American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

70. *Topological tunability from even-odd order parameter mixing of monolayer 1T-$TiSe_2$ charge density wave*, Ming-Chien Hsu, Shin-Ming Huang, **Bahadur Singh**, Chuang-Han Hsu, Suyang Xu, Hsin Lin, Chenliang Su, and Arun Bansil. American Physical Society March Meeting, Boston, Massachusetts, USA, March 2019

71. *Saddle-like topological surface states on the TT'X family of compounds (T, T' = Transition metal, X= Si, Ge),* **Bahadur Singh**, Xiaoting Zhou, Hsin Lin, Arun Bansil. American Physical Society March Meeting, Los Angeles, California, USA, March 2018

72. *Topological Hopf and Chain Link Semimetal States and Their Application to Co_2MnGa,* Daniel Multer, Guoqing Chang, Suyang Xu, Xiaoting Zhou, Shin-Ming Huang, **Bahadur Singh**, Baokai Wang, Ilya Belopolski, Jiaxin Yin, Songtian Sonia Zhang, Arun Bansil, Hsin Lin, and Zahid Hasan. American Physical Society March Meeting, Los Angeles, California, USA, March 2018

73. E*xperimental investigation of Co_2MnGa: candidate for the first intrinsic, three-dimensional topological magnet*, Ilya Belopolski, Daniel Sanchez, Guoqing Chang, Kaustuv Manna, Benedikt Ernst, Suyang Xu, Songtian Sonia Zhang, Hao Zheng, Jiaxin Yin, **Bahadur Singh**, Guang Bian, Daniel Multer, Xiaoting Zhou, Shin-Ming Huang, Baokai Wang, Arun Bansil, Hsin Lin, Claudia Felser, and Zahid Hasan. American Physical Society March Meeting, Los Angeles, California, USA, March 2018

74. *Universal Topological Electronic Properties of Nonmagnetic Chiral Crystals*, Guoqing Chang, Benjamin Wieder, Frank Schindler, Daniel Sanchez, Ilya Belopolski, Shin-Ming Huang, **Bahadur Singh**, Di Wu, Tay-Rong Chang, Titus Neupert, Suyang Xu, Hsin Lin, and Zahid Hasan. American Physical Society March Meeting, Los Angeles, California, USA, March 2018

75. *Discovery of Lorentz-violating type-II Weyl fermions in LaAlGe,* Daniel S. Sanchez, Su-Yang Xu, Nasser Alidoust, Guoqing Chang, Hong Lu, **Bahadur Singh**, Ilya Belopolski, Xiao Zhang, Guang Bian, Hao Zheng, Marius-Adrian Husanu, Yi Bian, Shin-Ming Huang, Chuang-Han Hsu, Tay-Rong Chang, Horng-Tay Jeng, Arun Bansil, Titus Neupert, Vladimir N. Strocov, Hsin Lin, and Shuang Jia, M. Zahid Hasan. American Physical Society March Meeting, New Orleans, Louisiana, USA, March 2017

76. *Strategies for Designing Magnetic Weyl Semimetals*, Guoqing Chang, Su-Yang Xu, Hao Zheng, **Bahadur Singh**, Chuang-Han Hsu, Shin-Ming Huang, Guang Bian, Ilya Belopolski, Daniel S. Sanchez, Nasser Alidoust, Tay-Rong Chang, Hong Lu, Xiao Zhang, Yi Bian, Zhi-Ming Yu, Shengyuan A. Yang, Horng-Tay Jeng, Titus Neupert, Shuang Jia, Arun Bansil, Hsin Lin, and M. Zahid Hasan. American Physical Society March Meeting, New Orleans, Louisiana, USA, March 2017

77. *Quasiparticle interference mapping of ZrSiS, Michael Lodge*, Md Mofazzle Hosen, Madhab Neupane, Masa Ishigami, Guoqing Chang, **Bahadur Singh**, Hsin Lin, Bent Weber, Jack Hellerstedt, Mark Edmonds, Michael Fuhrer, and Dariusz Kaczorowski. American Physical Society March Meeting, New Orleans, Louisiana, USA, March 2017

78. *Identifying the Dirac line node in the 3D semimetal ZrSiS*, Bent Weber, Michael S Lodge, Guoqing Chang, **Bahadur Singh**, Jack Hellerstedt, Mark Edmonds, Dariusz Kaczorowski, Md Mofazzel Hosen, Madhab Neupane, Hsin Lin, Michael S Fuhrer, and Masa Ishigami. American Physical Society March Meeting, New Orleans, Louisiana, USA, March 2017

79. *Role of Surface Termination in Realizing Well-Isolated Topological Surface States in $TlBiSe_2$ and $TlBiTe_2$*, **Bahadur Singh**, Hsin Lin, R. Prasad, and A. Bansil. IUMRS-ICEM2016, Suntec Singapore, July 2016.

80. *A Computational Approach to Understand the Promotional Effect in Ni-Fe Bimetallic Catalyst,* Koustuv Ray, Dharmendra Pandey, **Bahadur Singh**, Rajendra Prasad and Goutam Deo, XII European Congress on Catalysis, Kazan, Russia, September 2015.

81. *Orbital selective spin-texture in a topological insulator*, **Bahadur Singh** and R. Prasad. International conference on condensed matter physics-2014 (ICCMP-2014), Shimla, India, November 2014.

82. *Topological phases and Weyl semimetal in thallium based III-V-VI_2 ternary chalcogenides,* **Bahadur Singh**, R. Prasad, H. Lin, M.Z. Hasan, A. Bansil. MRS Fall meeting, Boston, MA, USA, November 2012.

Schools, Conferences and Contributed posters

83. Workshop on electron-electron interactions in topological materials, Yale-NUS College, Singapore, June 2017.

84. ICTS school and discussion meeting on strongly correlated systems-from models to materials, IISc Bangalore, India, January 2014.

85. International E-workshop on condensed matter physics and material science (IWCCMP-2013), ABV-IIITM Gwalior, India, November 2013.
Poster Title: "*Spin-texture of the non-trivial surface state of topological insulator Sb_2Te_3*"

86. School and workshop on electronic structure calculations with HPC systems, Uttarakhand, India, April 2013

87. International workshop on computational material science using full potential methods-international conference on advanced materials (ICAM-2011), Coimbatore, India, December 2011.

88. International conference on quantum effects in solids of today (I-ConQuEST) and K.S. Krishnan discussion meeting on the frontiers of quantum science, NPL New Delhi, India, December 2010.
Poster Title: "*Existence of topological phase in thallium based III-V-VI_2 ternary chalcogenides*"