

Name: Debashis Mondal

Assistant Professor

Department of Physics, Sovarani Memorial College

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Education:

2009: B.Sc. (Physics): Visva-Bharati University, India

2011: M.Sc. (Physics): Visva-Bharati University, India ; (Specialization in **Electronics**)

Ph. D.:

Thesis title: [Electronic structure study of FeGa₃ and FeAl intermetallics \(2019\)](#)

Homi Bhabha National Institute

Raja Ramanna Centre for Advanced Technology, Indore-452013

Work experience

Post Doc.

NPDF Fellowship:

Tata Institute of Fundamental Research, Colaba, Mumbai, (February 2022 - May 2023)

TRIL Fellowship:

ICTP TRIL Fellow, ICTP, Strada Costiera, 11 - I-34151 Trieste, Italy (18 May 2018 -2nd February 2021) ;
Post Doc. Fellow , CNR-IOM - IstitutoOfficinadeiMateriali, Edificio Q2, Area Science Park, Strada Statale
14, km 163,5, 34149 Basovizza TS

Publications in refereed journals:

1. Discovery of a magnetic Dirac system with large intrinsic non-linear Hall effect, Federico Mazzola, Barun Ghosh, Jun Fujii, Gokul Acharya, Debashis Mondal, Giorgio Rossi, Arun Bansil, Daniel Farias, Jin Hu, Amit Agarwal, Antonio Politano, and Ivana Vobornik, *Nano Letters*, **January 2023, 23(3)** , DOI: [10.1021/acs.nanolett.2c04194](https://doi.org/10.1021/acs.nanolett.2c04194)

2. Effect of Residual Carbon on Spin-Polarized Coupling at a Graphene/Ferromagnet Interface, Matteo Jugovac, Iulia Cojocariu, Francesca Genuzio, Chiara Bigi, Debashis Mondal, Ivana Vobornik, Jun Fujii, Paolo Moras, Vitaliy Feyer, Andrea Locatelli, Tevfik Onur Menteş, *Advanced Electronic Materials*, March 2023, DOI: [10.1002/aelm.202300031](https://doi.org/10.1002/aelm.202300031)

3. Disentangling Structural and Electronic Properties in V₂O₃ Thin Films: A Genuine Nonsymmetry Breaking Mott Transition
Federico Mazzola,* Sandeep Kumar Chaluvadi, Vincent Polewczyk, Debashis Mondal, Jun Fujii, Piu Rajak, Mahabul Islam, Regina Ciancio, Luisa Barba, Michele Fabrizio, Giorgio Rossi, Pasquale Orgiani, and Ivana Vobornik
Nano Lett., **22**, 5990, (2022)

4. Evidence of magnetism-induced topological protection in the axion insulator candidate EuSn₂P₂
Gian Marco Pierantozzi, Alessandro De Vita, Chiara Bigi, Xin Gui, Hung-Ju Tien, Debashis Mondal, Federico Mazzola, Jun Fujii, Ivana Vobornik, Giovanni Vinai, Alessandro Sala, Cristina Africh, Tien-Lin Lee, Giorgio Rossi, Tay-Rong Chang, Weiwei Xie, Robert J. Cava, and Giancarlo Panaccione
Proceedings of the National Academy of Sciences, **119**, e2116575119, (2022);
<https://doi.org/10.1073/pnas.2116575119>

5. Kitkaite NiTeSe, an ambient-stable layered Dirac semimetal with low-energy type-II fermions with application capabilities in spintronics and optoelectronics
Ivana Vobornik, Anan Bari Sarkar, Libo Zhang, D. W. Boukhvalov, Barun Ghosh, Lesia Piliai, Chia Nung Kuo, Debashis Mondal, Jun Fujii, C. S. Lue, Mykhailo Vorokhta, Huaizhong Xing, Lin Wang, Amit Agarwal, Antonio Politano
Adv. Funct. Mater. 2106101, (2021), DOI: [10.1002/adfm.202106101](https://doi.org/10.1002/adfm.202106101)

6. Magnetic Topological Semimetal Phase with Electronic Correlation Enhancement in SmSbTe
Krishna Pandey, Debashis Mondal, John William Villanova, Joseph Roll, Rabindra Basnet, Aaron Wegner, Gokul Acharya, Md Rafique Un Nabi, Barun Ghosh, Jun Fujii, Jian Wang, Bo Da, Amit Agarwal, Ivana Vobornik, Antonio Politano, Salvador Barraza-Lopez, Jin Hu
Adv. Quantum Technol., 2100063 (2021), DOI: [10.1002/qute.202100063](https://doi.org/10.1002/qute.202100063)

7. Mitrofanovite Pt₃Te₄: a Topological Metal with Termination-Dependent Surface Band Structure and Strong Spin Polarization
Jun Fuji, Barun Ghosh, Ivana Vobornik, Anan Bari Sarkar, Debashis Mondal, Chia Nung Kuo, François C. Bocquet, D. W. Boukhvalov, C. S. Lue, Amit Agarwal and Antonio Politano
ACS Nano, **15**, 14786 (2021) DOI: [10.1021/acsnano.1c04766](https://doi.org/10.1021/acsnano.1c04766)

8. Evidence of Robust Half-Metallicity in Strained Manganite Films
Gian Marco Pierantozzi, Giovanni Vinai, Aleksandr Yu. Petrov, Alessandro De Vita, Federico Motti, Vincent Polewczyk, Debashis Mondal, Tommaso Pincelli, Riccardo Cucini, Chiara Bigi, Ivana Vobornik, Jun Fujii, Piero Torelli, Francesco Offi, Giorgio Rossi, Giancarlo Panaccione, and Francesco Borgatti
The Journal of Physical Chemistry C **125**, 14430-14437 (2021), DOI: [10.1021/acs.jpcc.1c02323](https://doi.org/10.1021/acs.jpcc.1c02323)

9. High-frequency rectifiers based on type-II Dirac fermions

Libo Zhang, Lin Wang, Wanlong Guo, Huang Xu, Li Han, Zhiqingzi Chen, Kaixuan Zhang, Yao Yang, Chia-Nung Kuo, Chin Shan Lue, **Debashis Mondal**, Barun Ghosh, Jun Fujii, Ivana Vobornik, Amit Agarwal, Huaizhong Xing, Xiaoshuang Chen, Antonio Politano and Wei Lu

Nature communications, **12**, 1584 (2021)

10. Pulsed Laser Deposition of thin films by means of Nd:YAG laser source operating at its 1st harmonics : recent approaches and advances

S K Chaluvadi, **D Mondal**, C Bigi, D Knez, P Rajak, R Ciancio, J Fujii, G Panaccione, I Vobornik , G Rossi and P Orgiani

J. Phys. Mater., **4**, 032001 (2021) <https://doi.org/10.1088/2515-7639/abe661>

11. Direct-ARPES and STM investigation of FeSe thin film growth by Nd:YAG laser

Sandeep Kumar Chaluvadi, **Debashis Mondal**, Chiara Bigi, Jun Fujii, Rajdeep Adhikari, Regina Ciancio, Alberta Bonanni, Giancarlo Panaccione, Giorgio Rossi, Ivana Vobornik and Pasquale Orgiani

Coatings **2021**, *11*, 276; <https://doi.org/10.3390/coatings11030276>

12. Observation of bulk states and spin-polarized topological surface states in transition metal dichalcogenide Dirac semimetal candidate NiTe₂,

Barun Ghosh, **Debashis Mondal**, Chia-NungKuo, Chin Shan Lue, Jayita Nayak, Jun Fujii, Ivana Vobornik, Antonio Politano, and Amit Agarwal

Physical Review B, **100**, 195134 (2019)

13. Transition-Metal Dichalcogenide NiTe₂: An Ambient-Stable Material for Catalysis and Nanoelectronics

Silvia Nappini, Danil W. Boukhvalov, Gianluca D'Olimpio, Libo Zhang, Barun Ghosh, Chia-Nung Kuo, Haoshan Zhu, Jia Cheng, Michele Nardone, Luca Ottaviano, **Debashis Mondal**, Raju Edla, Jun Fujii, Chin Shan Lue, Ivana Vobornik, Jory A. Yarmoff, Amit Agarwal, Lin Wang, Lixue Zhang, Federica Bondino and Antonio Politano

Adv. Funct. Mater., 2000915 (2020).

14. Electronic Structure of Yb(Ni_{1-x}Co_x)₃Ga₉ Studied by Angle-resolved Photoelectron Spectroscopy

Yuki Utsumi, **Debashis Mondal** , Jun Fujii, Ivana Vobornik, Shota Nakamura, Dubravka Matković-Čalogović, and Shigeo Ohara

J. Phys. Soc. Jpn. **89**, 044711 (2020)

15. Surface states and Rashba-type spin polarization in antiferromagnetic MnBi₂Te₄(0001)

R. C. Vidal, H. Bentmann, T. R. F. Peixoto, A. Zeugner, S. Moser, C.-H. Min, S. Schatz, K. Kißner, M. Ünzelmann, C. I. Fornari, H. B. Vasili, M. Valvidares, K. Sakamoto, **D. Mondal**, J. Fujii, I. Vobornik, S. Jung, C. Cacho, T. K. Kim, R. J. Koch, C. Jozwiak, A. Bostwick, J. D. Denlinger, E.

Rotenberg, J. Buck, M. Hoesch, F. Diekmann, S. Rohlf, M. Kalläne, K. Rosnagel, M. M. Otrokov, E. V. Chulkov, M. Ruck, A. Isaeva, and F. Reinert

Phys. Rev. B **100**, 121104(R)

16. High-pressure studies on the properties of FeGa₃ : Role of on-site Coulomb correlation

Debashis Mondal, Velaga Srihari, C. Kamal, Himanshu Poswal, Alka B. Garg, Arumugam Thamizhavel, Soma Banik, Aparna Chakrabarti, Tapas Ganguli, and Surinder M. Sharma

Physical Review B, **95**, 134105 (2017)

17. Structural and electronic properties of Fe(Al_xGa_{1-x})₃ system

Debashis Mondal, C. Kamal, Soma Banik, Ashok Bhakar, Ajay Kak, Gangadhar Das, V. R. Reddy, Aparna Chakrabarti, and Tapas Ganguli,

Journal of Applied Physics **120**, 165102 (2016)

18. Electronic structure of FeAl alloy studied by resonant photo emission spectroscopy and Ab initio calculations

Debashis Mondal, Soma Banik, C. Kamal, ManglaNand, S.N. Jha, D.M. Phase, A.K. Sinha, Aparna Chakrabarti, A. Banerjee and Tapas Ganguli

Journal of Alloys and Compounds **688**, 187 (2016)

Conferences and Schools attended:

- International conference on Condensed Matter and Applied Physics, ICC – 2015, Oct 30-31, 2015; Organized by Department of Physics, Govt. Engineering College Bikaner
- DAE-BRNS symposium on Condensed Matter Physics under Extreme Conditions (COMPEC-2016), April 13-16, 2016; Organized by Physics Group, Bhabha Atomic Research Centre, Mumbai
- BRNS school on Computation Methodologies Across Length Scales, August 28 – September 09; Organized by Bhabha Atomic Research Centre, Mumbai
- XIV school on Synchrotron Radiation: Fundamentals, Methods and Applications, Muggia, Italy, 18-29 September 2017; Jointly organized by Societa Italiana di Luce di Sincrotrone (SILS) and Elettra – Sincrotrone Trieste (ScpA)
- Fifth Edition of Superfox conference on Superconductivity and Functional Oxides, 10-12 February 2020, Santa Margherita Ligure (Genoa, Italy)