Ajay D. Thakur, Ph.D. (TIFR)

Associate Professor, Department of Physics

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Research Interests

Condensed Matter Physics, Physics Driven Sustainable Functional Materials and Technologies

Education

Doctor of Philosophy, Tata Institute of Fundamental Research, INDIA — January 2007

Master of Science, Indian Institute of Technology Bombay, Mumbai, Maharashtra, INDIA — June 2000

Bachelor of Science, University of Mumbai, Mumbai, Maharashtra, INDIA. — June 1998

Current Position

Associate Professor, Department of Physics
Indian Institute of Technology Patna, Bihar 801103, INDIA. — 2019 – Present

Academic Experience

Assistant Professor, Department of Physics
Indian Institute of Technology Patna, Bihar 801106, INDIA — 2011-2019

Research Associate,
Department of Physics,
IIT Bombay,
Mumbai 400076, INDIA — 2010 – 2011

Institute Post-Doctoral Researcher
National Institute for Materials Science
Sengen, Tsukuba 305-0047, JAPAN — 2007 – 2010

Professional Memberships

Member, Indian Physics Association — Life

Member, Magnetics Society of India — Life

Research Mentorship Experience

Ph.D. students	3 (graduated); 3 (ongoing); 5 (co-advised; ongoing)
M. Tech. students	9 (completed)
M. Sc. students	5 (completed)
B. Tech. students	3 (co-advised with Engineering Department Colleagues)

Awards/Fellowships

Sl	Name of Award	Awarding Agency	Year
1	Certificate of Merit for being among top 0.1% in Science	CBSE	1993
2	Gold Medal in National Graduate Physics Examination	IAPT	1997
3	TIFR Graduate School Fellowship	DAE	2000-06
4	Kanwal Rekhi Fellowship	Kanwal Rekhi Foundation	2003-05
5	Post-Doctoral Fellowship	NIMS	2007-2010

6	Outstanding Reviewer Award	Elsevier	2014
7	Best UG Teacher in Physics	IIT Patna	2018
8	Best UG Teacher in Physics	IIT Patna	2019

Projects

Sl	Project Title	PI Name	Co-PI Name	Amount	Status	Date of Start	Date of Completion	Funding Agency
1	CZTS based flexible solar cells	Ajay D. Thakur	A. K. Thakur	14.16 Lakh	Completed	09-May-2014	08-May-2015	SRIRU, CEE IIT Patna
2	Design and Development of an Agricultural Waste Based Gasifier Heating System for GreenCHILLTM	Dr. Rishi Raj	Dr. Ajay D. Thakur	95.07 Lakh	Completed	17-Aug-2016	16-Aug-2018	MHRD, SERB and Industry UAY
3	Spin transport in 2D material/perovskites (LSMO) heterostructures	Dr. Jayakumar Balakrishnan	Dr. Ajay D. Thakur	31.79 Lakh	Completed	08-Jun-2016	07-Jun-2019	DST Nanomission
4	Development of an agricultural waste based off-the-grid climate control unit for storage and processing of agricultural produce	Dr. Rishi Raj	Dr. Ajay D. Thakur	98.3554 Lakh	Ongoing	22-Feb-2019	21-Feb-2022	IMPRINT-II
5	Persistent Light Emitting Phosphors for Solid State Lighting Applications	Dr. P Kumari	Dr. A. K. Choudhary, Dr. Ajay D. Thakur (Co-PI from mentor Institute), Dr. D. K. Siha	10.98	Ongoing	18-Jun-2019	30-Sep-2020	TEQIP Collaborative Research Scheme-III

Patents

Sl	Patent Title	Patent Status	Country	Name of Inventor	Patent Number
1	System and Method for Heat Recovery in Gasification Process	Filed	India	Sunil Kumar et al	E-1/12145/2018-KOL

Publications

Journal Articles

[1] Colossal Seebeck coefficient in Aurivillius phase-perovskite oxide composite, A. Kumar, D. Sivaprahasam, Ajay D. Thakur, Journal of Alloys and Compounds 853, 157001 (2021).

[2] Graphene mediated resistive switching and thermoelectric behavior in lanthanum cobaltate, A. Kumar, K. Kumari, S. Ray, Ajay D. Thakur, Journal of Applied Physics 127 (23), 235103 (2020).

[3] Structural and resistive switching behaviour in Lanthanum strontium manganite-Reduced graphene oxide nanocomposite system, K. Kumari, A. Kumar, D K. Kotnees, J. Balakrishnan, Ajay D. Thakur, S. Ray, Journal of Alloys and Compounds 815, 152213 (2020).

[4] Design, fabrication, and performance evaluation of a novel biomass-gasification-based hot water generation system, Sunil, Rahul Sinha, Chaitanya Bathina, Birendra K. Rajan, Anurag Agarwal, Ajay D. Thakur, Rishi Raj, Energy 185, 148-157 (2019).

[5] Comprehensive Loss Modeling in Cu2SnZnS4 Solar Cells, Atul Kumar and Ajay D. Thakur, Current Applied Physics 19, 1111-1119 (2019).

[6] Improving the optoelectrical properties of Cu_2ZnSnS_4 using gold and graphene nano-fillers, Atul Kumar, Ajay D. Thakur, Journal of Materials Science: Materials in Electronics 20, 8546-8554 (2019).

[7] Inducing Dye-selectivity in Graphene oxide for cationic Dye Separation Applications, Pranay Ranjan, Priyanshu Verma, Shweta Agarwal, T. Rajagopala Rao, Sujoy K. Samanta, Ajay D. Thakur, Materials Chemistry and Physics 226, 350 (2019).

[8] Thermoelectric Properties of (1-x)$LaCoO_3$.(x)$La_{0.95}Sr_{0.05}CoO_3$ composite, Ashutosh Kumar, K. Kumari, B. Jayachandran, D. Sivaprahasam, Ajay D. Thakur, Materials Research Express 6, 055502 (2019).

[9] A Low-Cost Non-explosive Synthesis of Graphene Oxide for Scalable Applications, Pranay Ranjan, Shweta Agarwal, Apurva Sinha, T. Rajagopala Rao, Jayakumar Balakrishnan, Ajay D. Thakur, Scientific Reports 8, 12007 (2018); DOI: 10.1038/s41598-018-30613-4.

[10] Biomass-gasification-based atmospheric water harvesting in India, B. Chaitanya, V. Bahadur, Ajay D. Thakur, R. Raj, Energy 165, 610-621 (2018); DOI: 10.1016/j.energy.2018.09.183.

[11] Graphene oxide based free-standing films for humidity and hydrogen peroxide sensing, Pranay Ranjan, Punam Tiwary, A. K. Chakraborty, R. Mahapatra, Ajay D. Thakur, J. of Mat. Sci.: Mat. In Elec. 25, 15946-15956 (2018); DOI:10.1007/s10854-018-9680-1.

[12] Magnetothermopower, magnetoresistance and magnetothermal conductivity in $La0._{95}Sr_{0.05}Co1._{-x}Mn_xO_3$ (0.00 ≤ x ≤ 1.00), Ashutosh Kumar, C. V. Tomy, Ajay D. Thakur, Mat. Res. Exp. 5, 086110 (2018).

[13] Role of contact work function, back surface field, and conduction band offset in Cu_2ZnSnS_4 solar cell, Atul Kumar, Ajay D. Thakur, Jpn. J. Appl. Phys. 57 (8S3), 08RC05 (2018).

[14] Thermoelectric properties of (1-x) $LaCoO_3$. $xLa_{0.7}Sr_{0.3}MnO_3$ composite, Ashutosh Kumar, Karuna Kumari, B. Jayachandran, D. Sivaprahsam, Ajay D. Thakur, Journal of Alloys and Compounds 735, 1787-1791 (2018).

[15] Improvement of thermoelectric properties of lanthanum cobaltate by Sr and Mn co-substitution, Ashutosh Kumar, D. Sivaprahsam, Ajay D. Thakur, Journal of Alloys and Compounds 735, 1787-1791 (2018).

[16] Improvement in Thermoelectric Properties by Tailoring at In and Te Site in In_2Te_5, Anup Kumar, Ajay D. Thakur, C. V. Tomy, J. Electron. Mater. 45, 11, 5540-5545 (2016).

[17] Effect of Sb deficiency on the thermoelectric properties of Zn_4Sb_3, Anup V. Sanchela, C. V. Tomy, Ajay D. Thakur, Sol. St. Commun. 218, 49 (2015).

[18] Growth and angular dependent resistivity of $Nb_2Pd_{0.73}S_{5.7}$ in superconducting single crystal fibers, A. K. Yadav, H. Sharma, A. D. Thakur, C. V. Tomy, Mater. Chem. and Phys. 164, 46 (2015).

[19] Effect of nominal substitution of transition metals for excess Fe in $Fe_{1+x}Se$ superconductor, Anil K. Yadav, Anup V. Sanchela, Ajay D. Thakur, C.V. Tomy, Sol. St. Comm. 202, 8 (2015).

[20] Enhancement in thermoelectric properties of $FeSb_2$ by Sb site deficiency, Anup V. Sanchela, Ajay D.Thakur, C.V. Tomy, J. of Mater. 1, 205 (2015).

[21] Growth, characterization, vortex pinning, and vortex flow properties of single crystals of the iron chalcogenide superconductor $FeCr_{0.02}Se$, Anil K. Yadav, Ajay D. Thakur, and C. V. Tomy, Phys. Rev. B 87, 174524 (2013).

[22] Vortex states in superconducting nanowires, K. Hirata, Ajay D. Thakur, and S. Ooi, Physica C 493, 47 (2013).

[23] Vortices in Superconducting Nano-networks with antidot arrays, K. Hirata, Ajay D. Thakur, S. Ooi, T. Mochiku, Cent. Eur. J. Phys. 10, 576 (2012).

[24] Magnetization hysteresis and time decay measurements in $FeSe_{0.5}Te_{0.5}$: Evidence for fluctuation in mean free path induced pinning, P. Das, A. D. Thakur, A. K. Yadav, C. V. Tomy, M. R. Lees, G. Balakrishnan, S. Ramakrishnan, A. K. Grover, Phys. Rev. B 84, 214526 (2011).

[25] Enhanced Superconducting properties in $FeCr_xSe$, A. K. Yadav, A. D. Thakur, C. V. Tomy, Sol. St. Comm. 151, 557 (2011).

[26] Quantum interference of impurity bound states in $Bi_2Sr_2Ca(Cu_{1-x}Zn_x)_2O_{8+\delta}$ probed by scanning tunneling spectroscopy, T. Machida, T. Kato, H. Nakamura, M. Fujimoto, T. Mochiku, S. Ooi, A. D. Thakur, H. Sakata, and K. Hirata, Phys. Rev. B84, 064501 (2011).

[27] Disappearance of zinc impurity resonance in large-gap regions of $Bi_2Sr_2CaCu_2O_{8+\delta}$ probed by scanning tunneling spectroscopy, T. Machida, T. Kato, H. Nakamura, M. Fujimoto, T. Mochiku, S. Ooi, A. D. Thakur, H. Sakata, and K. Hirata, Phys. Rev. B 82, 180507 (2010).

[28] Triangular antidot array to honeycomb wire network-Role of interstital vortices, A. D. Thakur, S. Ooi, K. Hirata, Physica C 469, 1071 (2009).

[29] Vortex Matching effect in engineered thin films of NbN, A. D. Thakur, S. Ooi, S. P. Chockalingam, J. Jesudasan,P. Raychaudhuri, K. Hirata, Appl. Phys. Lett. 94, 262501 (2009).

[30] Clean Superconducting In nanowires encapsulated within insulating ZnS nanotubes, G. Sheet, U. K. Gautam, A. D. Thakur, K. Hirata, Y. Bando and T. Nakayama, Appl. Phys. Lett. 94, 053108 (2009).

[31] Low temperature specific heat of superconducting ternary intermetallics $La_3Pd_4Ge_4$, $La_3Ni_4Si_4$, and $La_3Ni_4Ge_4$ with $U_3Ni_4Si_4$-type structure, S. Kasahara, H. Fujii, H. Takeya, T. Mochiku, A. D. Thakur, K. Hirata, Journal of Phys.: Cond. Matt. 20, 385204 (2008).

[32] Scan rate dependence of magnetization hysteresis in weakly pinned crystals of 2H-$NbSe_2$ and $Ca_3Rh_4Sn_{13}$: A vibrating sample magnetometer study, A. D. Thakur, D. Pal, M. J. Higgins, S. Ramakrishnan , and A. K. Grover, Physica C 466, 181 (2007).

[33] Critical points in the Bragg glass phase of a weakly pinned crystal of $Ca_3Rh_4Sn_{13}$, S. Sarkar, A. D. Thakur, C. V. Tomy, G. Balakrishnan, D. Mck Paul, S. Ramakrishnan and A. K. Grover, Pramana-J. Phys. 66, 193 (2006).

[34] Effect of pinning and driving force on the metastability effects in weakly pinned superconductors and the determination of spinodal line pertaining to order-disorder transition, A. D. Thakur, S. S. Banerjee, M. J. Higgins, S. Ramakrishnan and A. K. Grover, Pramana-J. Phys. 66, 159 (2006).

[35] Pulverization of the flux line lattice, the phase coexistence and the spinodal temperature of the order-disorder transition in a weakly pinned crystal of $Yb_3Rh_4Sn_{13}$, S. Sarkar, C. V. Tomy, A. D. Thakur, G. Balakrishnan, D. Mck Paul, S. Ramakrishnan and A. K. Grover, Pramana-J. Phys. 66, 179 (2006).

[36] Flux jumps, second magnetization peak anomaly and the peak effect phenomena in single crystals of YNi_2B_2C and $LuNi_2B_2C$, D. Jaiswal Nagar, A. D. Thakur, S. Ramakrishnan, A. K. Grover, D. Pal and H. Takeya, Phys. Rev. B 74, 184514 (2006).

[37] Evolution in the split-peak structure across the Peak Effect region in single crystals of 2H-$NbSe_2$, A. D. Thakur, T. V. Chandrasekhar Rao, S. Uji, T. Terashima, M. J. Higgins, S. Ramakrishnan and A. K. Grover, J. Phys. Soc. Jpn. 75, 074718 (2006).

[38] Exploring metastability via the third harmonic measurements in single crystals of 2H-$NbSe_2$ showing anomalous Peak effect, A. D. Thakur, S. S. Banerjee, M. J. Higgins, S. Ramakrishnan and A. K. Grover, Phys. Rev. B 72, 134524 (2005).

Peer Reviewed Publications in Conferences (Indian and International)

[39] Graphene Oxide Based PN Junctions, P. Ranjan, A. Kumar, J. Balakrishnan, Ajay D. Thakur, Materials Today Proceedings 11, 830-832 (2019).

[40] Dye Adsorption Behavior of Graphene Oxide, P. Ranjan, J. Balakrishnan, Ajay D. Thakur, Materials Today Proceedings 11, 833-36 (2019).

[41] Improvement of efficiency in CZTSSe solar cell by using back surface field, Atul Kumar, Ajay D. Thakur, IOP Conf. Series: Materials Science and Engineering 360, 012027 (2018). DOI:10.1088/1757-899X/360/1/012027.

[42] Secondary Phases in CZTS Thin Films Grown Using Direct Liquid Coating Approach, Atul Kumar, Pranay Ranjan, Ajay D. Thakur, Materials Today Proceedings 5, 99-103 (2018).

[43] Free Standing Graphene Oxide Films for Gas Sensing Applications, Pranay Ranjan, Atul Kumar, Ajay D. Thakur, Materials Today Proceedings 5, 732-736 (2018).

[44] Investigating absence of optimal photovoltaics response in CZTS solar cell, Atul Kumar, Ajay D. Thakur, AIP Conference Proceedings 1953 (1), 050024 (2018).

[45] The simulation of CZTS solar cell for performance improvement, Atul Kumar, Ajay D. Thakur, AIP Conference Proceedings 1953 (1), 050009 (2018).

[46] Design issues for optimum solar cell configuration, Atul Kumar, Ajay D. Thakur, AIP Conference Proceedings 1953 (1), 050022 (2018).

[47] Free standing graphene oxide film for hydrogen peroxide sensing, Pranay Ranjan, Jayakumar Balakrishnan, Ajay D. Thakur, AIP Conference Proceedings 1953 (1), 030029 (2018).

[48] SrBi4Ti4O15 Aurivillius phase thin films by pulsed laser deposition using Nd:YAG laser, Ashutosh Kumar, Ajay D. Thakur, AIP Conference Proceedings 1953 (1), 100010 (2018).

[49] Magnetism in $La_{0.7}Sr_{0.3}Mn_{1-x}Co_xO_3$ ($0 \le x \le 1$), (DAE-SSPS) Ashutosh Kumar, Himanshu Sharma, C. V. Tomy, Ajay D. Thakur, AIP Conference Proceedings 1731, 130045 (2016).

[50] Extreme sensitivity of magnetic properties on the synthesis routes in $La_{0.7}Sr_{0.3}MnO_3$, Ashutosh Kumar, Himanshu Sharma, C. V. Tomy, Ajay D. Thakur, AIP Conference Proceedings 1728, 020494 (2016).

[51] Solvent free tin oxide nanoparticle for gas sensing application, Pranay Ranjan and Ajay D. Thakur, AIP Conference Proceedings 1728, 020616 (2016).

[52] Anisotropic thermal conductivity and thermopower of the In_2Te_5 single crystals, (DAE-SSPS) Anup V. Sanchela, Ajay D. Thakur, C. V. Tomy, AIP Conference Proceedings 1591, 1392 (2014).

[53] Determination of residual stress in MEMS cantilevers, T. Bera and Ajay D. Thakur, (DAE-SSPS) AIP Conference Proceedings 1591, 683 (2014).

[54] Vortex lattices and their transformations in rectangular antidote arrays, (DAE-SSPS) Ajay D. Thakur, S. Ooi, M. Chand, J. Jesudasan, P. Raychaudhuri, K. Hirata, AIP Conference Proceedings 1591, 1651 (2014).

[55] Nanostructured zinc oxide as a prospective room temperature thermoelectric material, (DAE-SSPS) P. Kumar, M. Kar, Anup V. Sanchela, C. V. Tomy, Ajay D. Thakur, AIP Conference Proceedings 1512, 364 (2013).

[56] Effect of off-stoichiometry at the Fe-site in $FeSe_{0.5}Te_{0.5}$ superconductor, (SMND) Anil K. Yadav, Ajay D. Thakur and C. V. Tomy, Physics Procedia 49, 109 (2013).

[57] Improvement in the thermoelectric properties of Zn_4Sb_3 induced by Sb deficiency, Anup V. Sanchela, Ajay D. Thakur, C. V. Tomy, (DAE-SSPS) AIP Conference Proceedings 1512, 1058 (2013).

[58] Vortex pinning mechanism in single crystal of iron arsenide superconductor $SrFe_{1.7}Co_{0.3}As_2$, (DAE-SSPS) Ajay D. Thakur, A. K. Yadav, A. Thamizhavel, C. V. Tomy, S. Ramakrishnan, A. K. Grover, AIP Conference Proceedings 1512, 1174 (2013).

[59] Single crystals of iron chalcogenide superconductor $FeCr_{0.02}Se$: Growth, characterization and vortex pinning properties, (DAE-SSPS) Anil K. Yadav, Ajay D. Thakur, C. V. Tomy, AIP Conference Proceedings 1512, 1158 (2013).

[60] Enhancement of Thermopower due to deficiency of Sb in $FeSb_2$, Anup V. Sanchela, V. Kushwaha, Ajay D. Thakur, C. V. Tomy, Adv. Mat. Res. 665, 179 (2013).

[61] Pinning Mechanism in Iron Chalcogenide Superconductor $FeSe_{0.5}Te_{0.5}$, (DAE-SSPS) Ajay D. Thakur, A. K. Yadav, P. Das, C. V. Tomy, M. R. Lees, G. Balakrishnan, S. Ramakrishnan, A. K. Grover, AIP Conference Proceedings 1447, 897 (2012).

[62] Room Temperature Thermoelectric Material $Fe(Sb_{1-x}Se_x)_2$, Anup V. Sanchela, Ajay D. Thakur, C. V. Tomy, (DAE-SSPS) AIP Conference Proceedings 1447, 1003 (2012).

[63] Multi-quanta vortex states, crossover to Abrikosov's lattice and peak effect phenomena in $Ca_3Rh_4Sn_{13}$, S. Kumar, Ajay D. Thakur, Ravi Singh, A. Thamizhavel, C. V. Tomy, A. K. Grover, (DAE-SSPS) AIP Conference Proceedings 1447, 909 (2012).

[64] Role of excess Cr at Fe site in $FeCr_xSe$ and $FeCr_xSe_{0.5}Te_{0.5}$, A. K. Yadav, A. D. Thakur, C. V. Tomy, (DAE-SSPS) AIP Conference Proceedings 1447, 907 (2012).

[65] Intermediate vortex states in nanoscale anti-dots and mesoscopic superconductors, K. Hirata, A. D. Thakur, S. Ooi, T. Mochiku, *J. Phys.: Conf. Ser.* 248, 012030 (2011).

[66] Multi-vortex versus interstitial vortices scenario in superconducting antidot arrays, A. D. Thakur, S. Ooi, S. P. Chockalingam, J. Jesudasan, P. Raychaudhuri, K. Hirata, Physica C 470, 1112 (2010).

[67] Intermediate State in Mesoscopic Cylinders of Type-I Superconducting Indium, Ajay D. Thakur, S. Ooi, K. Hirata, Japanese Physical Society Meeting, 日本物理学会講演概要集65 (1), 820 (2010).

[68] Observation of Vortex Matching Phenomena in Antidot Array of NbN Thin Film , A. D. Thakur, S. Ooi, S. P. Chockalingam, J. Jesudasan, P. Raychaudhuri, K. Hirata, Physica C 470, S873 (2010).

[69] Superconducting antidot arrays: Multi-vortex versus Interstitial Vortices, Ajay D. Thakur, S. Ooi, P. Raychaudhuri, K. Hirata, Japanese Physical Society Meeting, 日本物理学会講演概要集 64 (2), 696 (2009).

[70] Vortex matching effects in ultra-clean NbN thin films, Ajay D. Thakur, S. Ooi, P. Raychaudhuri, K. Hirata, Japanese Physical Society Meeting, 日本物理学会講演概要集 64 (1), 778 (2009).

[71] Novel vortex matching effects in antidot arrays, Ajay D. Thakur, S. Ooi, M. Kamran, S. P. Zhao, X. G. Qiu, K. Hirata, Japanese Physical Society Meeting, 日本物理学会講演概要集 63 (2), 697 (2008).

[72] Antidot Arrays in Superconducting Nb films: Role of Interstitial Vortices, Ajay D. Thakur, M. Kamran, S. P. Zhao, X. G. Qiu, S. Ooi, K. Hirata, Japanese Physical Society Meeting, 日本物理学会講演概要集 63 (1), 754 (2008).

[73] Effect of Pinning and Driving Force on the Phase Transformations in the Weakly Pinned Vortex Matter in Conventional Superconductors, Ajay D. Thakur, D. Pal, S. S. Banerjee, T. V. Chandrasekhar Rao, M. J. Higgins, S. Ramakrishnan, A. K. Grover, Japanese Physical Society Meeting, 日本物理学会講演概要集 62 (2), 802 (2007).

[74] Modulations in the dynamical response across the phase co-existence region in a weakly pinned crystal of 2H-$NbSe_2$, A. D. Thakur, D. Pal, M. J. Higgins, S. Ramakrishnan and A. K. Grover, Physica C 460-462, 1259 (2007).

[75] Effect of pinning and driving force on the phase transformations in the weakly pinned vortex matter, A. D. Thakur, Solid State Physics (India) 51, 999 (2006).

[76] Distribution of Noise across the Peak Effect regime, S. S. Banerjee, Shyam Mohan, Jaivardhan Sinha, A. D. Thakur, S. Ramakrishnan, A. K. Grover, A. K. Sood, Solid State Physics (India) 51, 665 (2006).

[77] dHvA Oscillations, upper critical fields and the peak effect studies in YNi_2B_2C and $LuNi_2B_2C$, D. Jaiswal-Nagar, A. D. Thakur, M. R. Eskildsen, P. C. Canfield, S. M. Yusuf, S. Ramakrishnan and A. K. Grover, Physica B 359-361, 476 (2005).

[78] Two peaks feature across the peak effect anomaly in weakly pinned crystals of 2H-$NbSe_2$, A. D. Thakur, T. V. Chandrasekhar Rao, S. Uji, T. Terashima, M. J. Higgins, S. Ramakrishnan and A. K. Grover, Solid State Physics (India) 50, 669 (2005).

[79] Effect of pinning on the dynamical response in weakly pinned crystals of 2H-$NbSe_2$, A. D. Thakur, D. Pal, M. J. Higgins, S. Ramakrishnan, Solid State Physics (India) 50, 671 (2005).

[80] Effect of Driving Force on the State of Phase Co-existence in Weakly Pinned Single Crystals of $CeRu_2$ and $LuNi_2B_2C$, D. Jaiswal-Nagar, A. D. Thakur, S. S. Banerjee, T. Isshiki, H. Aoki, Y. Onuki, M.R. Eskildsen, P. C. Canfield, S. Ramakrishnan and A. K. Grover, Solid State Physics (India) 50, 673 (2005).

[81] Polycrystalline form of the flux line lattice and the anomalous variations in the critical current density, S. S. Banerjee, A. D. Thakur, S. Ramakrishnan and A. K. Grover, Solid State Physics (India) 50, 667 (2005).

[82] Metastability across the peak position of the peak effect in weakly pinned vortex matter, A. D. Thakur, S. S. Banerjee, M. J. Higgins, S. Ramakrishnan and A. K. Grover, Solid State Physics (India) 49, 649 (2004).

[83] Study of the Phase Diagram of $LuNi_2B_2C$ through the Quadrupole Moment Measurement, D. Jaiswal-Nagar, A. D. Thakur, M.R. Eskildsen, P.C. Canfield, S.M. Yusuf, S. Ramakrishnan and A.K. Grover, Solid State Physics (India) 49, 622 (2004).

[84] Synthesis of good quality LCMO/YBCO heterostructures by pulsed laser deposition technique, S. K. Wanchoo, J. Jesudasan, V. C. Bagwe, A. D. Thakur, U. D. Vaishnav, S. P. Pai, A. M. Narsale and R. Pinto, Nucl. Instr. and Meth. in Phys. Res. B 212, 539 (2003).

[85] Study of the Phase Diagram of $LuNi_2B_2C$ through the Quadrupole Moment Measurement, D. Jaiswal-Nagar, A. D. Thakur, M.R. Eskildsen, P.C. Canfield, S.M. Yusuf, S. Ramakrishnan and A.K. Grover, Solid State Physics (India) 46, 647 (2003).

[86] Measurement of Quadrupole Moment Across Peak Effect in a Weakly Pinned Single Crystal of $CeRu_2$, D. Pal, A. D. Thakur, D. Jaiswal, S. Ramakrishnan, A.K. Grover, E. Yamamoto, Y. Haga, M. Hedo, Y. Inada and Y. Onuki, Solid State Physics (India) 46, 623 (2003).

[87] Study of the peak effect in weakly pinned single crystals of $LuNi_2B_2C$, Solid State Physics (India) 46, 647 (2003).

[88] Effect of post annealing on properties of $La_{0.9}Sn_{0.1}MnO_3$ thin films, A. D. Thakur, S. Satsangi and P. Raychaudhuri, Solid State Physics (India) 46, 435 (2003).

Invited Talks and Seminars

[1] Advancements in Bolometry: From Superconducting Transition Edge Detectors to Thermoelectric Membranes, ATAL FDP on Sensor Technology, Tripura University, September 21, 2020.

[2] Understanding Nature through Physics, A talk in the JNV Vigyaan Jyoti program with IIT Patna as knowledge partner, July 27, 2020.

[3] Graphene Oxide: Prospects and Challenges, in Current Trends in Physical Sciences Jointly organized by AKTU and IAPT, July 28, 2020.

[4] Insights from Similarities in Physical Phenomenon - Intuition and Beyond, A talk in the JNV Vigyaan Jyoti program with IIT Patna as knowledge partner, July 18, 2020.

[5] Graphene Oxide: Prospects and Challenges, Webinar, St. John's College, Agra, May 11, 2020.

[6] Curious Case of Graphene Oxide, Webinar Series during Lockdown, TIFR (Mumbai), April 18, 2020.

[7] Graphene Oxide, ICMS-2020, Tripura University, March 5, 2020.

[8] "Medemer" and Peace in the horn of Africa, Nobel Peace Prize 2019 Illustration Lecture, February 12, 2020.

[9] Graphene: Bringing Revolution in Industry, BIT-Mesra (Patna Campus), October 20, 2019.

[10] Physics Driven Search and Development of Functional Materials for Sustainable Future, DEI, Agra, August 16, 2019.

[11] Synergistic Approach to Functional Materials for Sustainable Future: A Physicists Perspective on Materials, IIT Indore, July 3, 2019.

[12] A Physicists Perspective on Energy Security and Role of Materials, DST-SERB School, IIT-ISM Dhanbad, May 3, 2019.

[13] *'Ikigaki*, Teaching Physics, *Intuition and beyond',* IAPT RESPECT-KV, IIT Patna, August 6, 2018.

[14] 'Sustainability: Challenges and Opportunities', Induction Program, IIT Patna, August 2, 2018.

[15] 'Efficient Thermoelectric Materials: Band Gap Engineering, Spin Entropy, 3D-superlattices and beyond', Q-MAT-2018, IISER Mohali, July 27, 2018.

[16] 'Friction and Harmony: Physics Pedagogy', IAPT RESPECT-KV, IIT Patna, July 19, 2018.

[17] 'On contribution of Indian Scientists', Patna University, April 15, 2018.

[18] 'Non-toxic Earth Abundant Element Based Functional Nanomaterials - Scope (Prospects) and Challenges', ICN:3I-2017, IIT Roorkee, December 7, 2017.

[19] 'Focused Ion Beam Milling as a Promising Rapid Prototyping Tool for Superconducting Circuits', EASSE-2017, IIT Delhi, December 6, 2017.

[20] Gravitational Waves and the Laser Interferometric Gravitational Wave Observatory (LIGO) Experiments, Nobel Prize in Physics 2016 Illustration Lecture, November 8, 2017.

[21] 'Sustainability: Challenges and Opportunities', Induction Program, IIT Patna, July 30, 2018.

[22] 'Statistical Mechanics', Advances in Physics: From Concepts to Applications, IIT Patna, July 20, 2017.

[23] 'Physics Pedagogy', IAPT RESPECT-KV, IIT Patna, April 9, 2017.

[24] 'Earth Abundant Element Based Functional Nanomaterials - Scope (Prospects) and Challenges', ICMS-2017, Tripura University, February 16, 2017.

[25] Topological Phase Transitions and Topological Phases of Matter, Nobel Prize in Physics 2016 Illustration Lecture, November 3, 2016.

[26] 'Insights from Similarities in Physical Phenomenon: Intuition and Beyond', IAPT RESPECT-KV, IIT Patna, October 23, 2016.

[27] 'Formulas in Physics: Intuition and Beyond', Advances in Physics: From Concepts to Applications, IIT Patna, July 15, 2016.

[28] 'Formula's in Physics: Intuition and Beyond' at Workshop titled Concepts of Physics through Experiments, IIT Patna, July 15, 2015.

[29] 'Nanomaterials for Energy: Earth Abundant Elements based Nanomaterials' at INUP Workshop conducted jointly by CeNSE, IISc Bangalore and IIT Patna, October 8-9, 2015.

[30] 'Vortex lattices and their transformations in rectangular antidote arrays' at the 58th DAE Solid State Physics Symposium held at Thapar University Patiala on December 20, 2013.

[31] 'Fluxtronics', Invited Lecture at workshop titled Development of Nanotechnology based Sensors for Defence Application: Nanoscale Innovation organized at VITM, Buxar on September 16, 2012.

[32] 'Physics of vortices in Sub-Micro Engineered Superconducting Superconductors', Invited lecture in Department of Physics, University of Mumbai, September 16, 2011.

[33] 'Intermediate State in Mesoscopic cylinders of type-I superconducting Indium' at the Japanese Physical Society Meeting held at Okayama University, Okayama (Japan) March 20-24, 2010.

[34] 'Multi-vortex versus Interstitial Vortices scenario in Superconducting antidot arrays' at 22nd International Symposium on Superconductivity to be held in Tsukuba (Japan), November 2-4, 2009.

[35] 'Superconducting antidot arrays: Multi-vortex versus interstitial vortices' at the Japanese Physical Society Meeting held at Kumamoto University, Kumamoto (Japan), September 25-28, 2009.

[36] 'Vortex matching effects in moderately clean NbN thin films' at the Japanese Physical Society Meeting held at Rikkyu University, Tokyo (Japan), March 27-30, 2009.

[37] 'Vortex matter in nano-engineered superconducting thin films', Condensed Matter Physics Seminar (TIFR), February 2009.

[38] 'Vortex Physics in superconducting single crystals and thin films' at the Weizmann institute of Science, Israel, Februrary 2009.

[39] 'Antidot arrays' at 21st International Symposium on Superconductivity held in Tsukuba (Japan), October 27-29, 2008.

[40] 'Novel Vortex Matching Effects in Antidot Arrays' at the Japanese Physical Society Meeting held at Iwate University, Morioka (Japan), September 20-23, 2008.

[41] 'Antidot Arrays in Superconducting Nb films: Role of Interstitial Vortices' at the Japanese Physical Society meeting held at Kinki University, Osaka (Japan), March 22-26, 2008.

[42] 'Effect of Pinning and Driving Force on the Phase Transformations in the Weakly Pinned Vortex matter', Superconducting Materials Center Seminar at NIMS, November 2, 2007.

[43] 'Study of Phase transformations via Anomalous Peak(s) Effects in Weakly Pinned Superconductors' at the 22nd International Conference on Statistical Physics (StatPhys-22) held at Indian Institute of Science, Bangalore (India), July 4-9, 2004.

[44] 'Effect of post annealing on properties of $La_{1-x}Sn_xMnO_3$ thin films' at the National Laser Symposium on Pulsed Laser Deposition held at University of Pune, November 2003.

Crucial Administrative Responsibilities

Professor in charge, Institute Annual Reports, IIT Patna ▪ Streamlined the process (information collection, translation and archiving on module)	2012 – 2016
Convener, Foundation Day, IIT Patna ▪ Organized Blood Donation and Plantation Drive apart from regular activities including Foundation Day Lecture and Debate	2012
Professor in charge, Institute Lectures, IIT Patna ▪ Initiated laboratory visits and interaction sessions with faculty and students for the Invited speakers	2012 – 2014
Faculty Advisor, M.Tech. (Nanoscience and Technology), IIT Patna ▪ Contributed to streamlining the M.Tech. program and ensuring successful coordination between participating Departments	2012 – 2016
Program Coordinator, NSS Units-IIT Patna ▪ Streamlined NSS activities and created a footprint in the regional NSS map through extensive work in adjoining villages; Catalyzed Prayatna	2016 – 2018
Professor-In-Charge, Convocation ▪ Cost cutting without compromising on the quality and nature of event	2018
Convener, Research Scholars Day ▪ Enhanced participation of research scholars	2018
Professor-In-Charge, School ▪ Sustained efforts to meet the demands of campus community; contributed towards initiating KV on campus	2018 – present
Besides the above, have also taken up suitable responsibilities at the Department level including Time Table In-charge, DAPC member, Department PhD Coordinator, Department Purchase Committee Member, Local Organizing Committee member for various conferences, workshops and short term programs organized by the Physics Department	