

Assistant Professor  
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## Research interest:

### Magnetism and spin dependent transport in nanoscale structures

- Magnetic thin films and multilayers
- Functional oxides
- Magnetic materials

## Teaching experience:

**Assistant Professor**, Department of Physics, Central University of Rajasthan, July 2012 onwards.

Courses: Condensed Matter Physics-I, Condensed Matter Physics-II, Methods of Experimental Physics (PG Course), Research Methodology (Pre-PhD), Atomic & Nuclear Physics, Electronics (UG), Physics Lab (PG and UG).

**Post-doctoral fellow**, University of Konstanz, Germany, 2009-2010: Lab (Sole) instructor for PG Physics Lab.

## Research experiences:

- **Postdoctoral Fellow**, Department of Physics, **National University of Singapore, July 2011 – July 2012**
- **Postdoctoral Fellow**, Department of Physics, **University of Konstanz, Germany, November 2008 to June 2011**
- **Research Fellow**, **Institute for Solid State and Material Research (IFW) Dresden, Germany, November 2004 to October 2008**
- **M. Tech Project**, **Indian Institute of Technology (IIT) Kharagpur, India May 2003 to May 2004**

## Education:

- **Ph.D., Physics**, Institute for Solid State and Material Research (IFW) Dresden, Germany & TU Dresden, Germany
- **M.Tech.**, Solid State Technology, IIT Kharagpur, India,
- **M.Phil & M.Sc.** Physics, Sambalpur University, Orissa, India

## Skills:

- Low temperature magneto-transport measurements, Magnetic characterizations (SQUID, VSM and ac susceptibility), Structural analysis (X-ray), Chemical analysis (SEM and EDX), UHV operation, Nanofabrication (e-beam lithography), Thin film depositions (PLD and thermal evaporation), Micromagnetics simulations (LLG and OOMMF).
- P.G Physics Lab and research lab development (at Central University of Rajasthan)
- Syllabus design for Integrated M.Sc course (at Central University of Rajasthan)
- UG lab development (at Central University of Rajasthan): designing and tendering the furniture and lab experiments

## Professional activities:

**Membership:** Magnetic Society of India (Life member), Material Research Society of India (Life member)

### Organizing committee:

- National Symposium on Technologically Advanced Functional Materials (NSTAFM-2017) organized by Department of Physics, Central University of Rajasthan, March 16-17, 2017 (**Convener**).
- (National Organizing Committee member) Conference on Advanced Materials and Processing (CAMP 2015) held at MNIT Jaipur from 2nd to 4th December 2015.
- One day workshop on “Pace Setting Role of Central Institutions” to prepare the policy documents for the New Education Policy initiated by MHRD New Delhi, at Central University of Rajasthan 26th August 2015.
- Indian academy of Sciences sponsored 68th Refresher course in Experimental Physics from 10th-25th March 2015 organized by Department of Physics, Central University of Rajasthan
- International Symposium on Nanoscale Science of Clusters, Nanoparticles and Nanoscale-Materials SOCNAM-2013 held at Jaipur 4th-7th March 2013 organized by Department of Physics, Central University of Rajasthan
- One day national workshop: Dynamics day Rajasthan on 29th November 2014 at Central University of Rajasthan
- DST-SERC school on non linear dynamics from 1st to 20th December 2014 at Central University of Rajasthan
- National Science Day- an open house event for school children and university students on the theme of education for sustainable development on 28th February 2014 (**Organizing secretary and treasurer**)
- **Reviewer:** Journal of Physics D: Applied Physics, Journal of Magnetism and Magnetic Materials, IEEE Transactions on Magnetics, Journal of Nanomaterials, Journal of American Ceramic Society
- Editorial Board Member: Research & Reviews: Journal of Pure and Applied Physics

- **Chaired a session in European School on Magnetism:** New experimental approaches in magnetism held at Constanta, Romania, 7-16 September 2005.

### Achievements & scholarships:

- **Member of the "Ambassador Club" University of Konstanz, Germany:** an International Alumni Network to foster research collaboration and exchange of ideas.
- **Got selected as UGC-Assistant Professor (Physics)** under *UGC-Faculty Recharge program* through a national selection process.
- **Finalist for best student presentation award** at 52<sup>nd</sup> *Magnetism and Magnetic Materials Conference* held at Tampa, Florida, 5-9 November 2007.
- **Best poster award** at *International Wilhelm and Else Heraeus Summer school on "Nanomagnetism"* held at the castle of Rauschholzhausen (Germany), 25-29 September 2006.
- **Silver medal for highest GPA in M.Tech** from IIT Kharagpur, 2004 Physics batch.
- **Finalist for best poster award** at 15<sup>th</sup> *AGM of Material Research Society of India* held at BHU, INDIA, 9-11 February 2004.
- **Qualified CSIR-UGC (JRF-Junior Research Fellowship)** held during June 2003, (**NET-National Eligibility Test**) December 2001.
- **Postgraduate scholarship** during M.Tech from Government of India
- **Qualified GATE-2002** in Physics with 98.03 percentile, **All India Rank: 33**

### Extra co-curricular activities:

- **Assistant Proctor, Warden**, Central University of Rajasthan (02-09-2013 to 01-09-2014)
- **Active secretary, Innovation Club**, Central University of Rajasthan (June 2013-July 2016)
- **Examination & Time table in-charge, Purchase in-charge**, Department of Physics, Central University of Rajasthan (Since March 2013)
- **Faculty Co-coordinator**, Department of Physics, Central University of Rajasthan (since July 2015)
- **University Complaint Cell**, Member, Central University of Rajasthan (Since Aug 2016)
- **Sport Club**, Member, Central University of Rajasthan (Since Aug 2016)
- **Academic Committee**, Central University Common Entrance Test (CUCET 2016)
- **Program Officer, NSS unit**, Central University of Rajasthan (Departmental and University committee) (28.08.2012 for a period of one year)
- **Placement co-coordinator**, Department of Physics, Central University of Rajasthan (one semester)
- **Member, Committee for University accommodation** for staff (2nd May 2014- June 2017)
- **Member, Internal Committee for Annual Magazine:** Annual Report, News Bulletin (16th Sept 2013-July 2016)
- **Members of other committees:** Campus wi-fi, University webpage and others

### Conferences & workshops (attended):

- International Conference on Magnetic Materials & Applications (ICMAGMA-2017) organized by DMRL Hyderabad and Magnetic Society of India held at Hyderabad, India during 01-03 February 2017.
- Suhail Ahmad Ganie and Ajit Kumar Patra "Chemical synthesis of iron chalcogenide magnetic nanoparticles" presented at National Symposium on Emerging Trends in Applied Chemical Sciences (STACS-2016) organized by Department of Chemistry, Central University of Rajasthan on 18th March 2016
- Attended and deliver an invited lecture at "Recent Advances in Chemical Sciences" (RAICS 2015) organized by Department of Chemistry, MNIT Jaipur, Rajasthan India to be held during 21st – 23rd August 2015. (Invited talk)
- Attended and deliver an invited lecture at Conference on Advanced Materials and Processing" (CAMP- 2015) organized MNIT Jaipur, Rajasthan India held during 02 – 04 December 2015. (Invited talk)
- First meeting of the Ambassadors' club at University of Konstanz, Germany from 17 to 20 November 2015.
- International Conferences "Constructions of Multiculturalism: identity and Diversity in European History" from 16-19 September 2015 at the Charles University in Prague organized by University of Konstanz, Germany to strengthen the International Research Alumni Network.
- Indian academy of Sciences sponsored 68th Refresher course in Experimental Physics from 10th-25th March 2015 organized by Department of Physics, Central University of Rajasthan
- A. K. Patra, F. Fleischhauer, S. Oswald, L. Schultz, V. Neu "Highly anisotropic epitaxial magnetic bilayers: an analysis of coercivity mechanism" (poster) presented at Indo-Japan Workshop on Magnetism at Nanoscale (IJWMN), NISER Bhubaneswar, India during 09th to 12th January 2015.
- Vinod Saini, Kanika Maheshwari, Surendra Kumar, N. Panwar and A. K. Patra "Transport and magnetic properties of Ca and Fe doped RTiO<sub>3</sub> (R = La and Sm) perovskites" (poster) presented at the International Conference on Condensed Matter Physics (ICOMP-2014) held at Himachal Pradesh University Shimla, Shimla India 4th to 6th November 2014.

- UGC-Sponsored Orientation Programme organized by UGC Academic Staff College Jai narin Vyas University, Jodhpur from 15th December 2013 to 11th January 2014.
- National Conference on "Technical Advances in Materials Science & Research (NCTAMSR-2014) organized by School of Physics, Sambalpur University Odisha during 13th -15th February 2014. (Invited talk)
- A. K. Patra, F. Fleischhauer, S. Oswald, L. Schultz, V. Neu "Magnetization reversal mechanism in hard magnetic epitaxial bilayers: SmCo<sub>5</sub>/Pr-Co" (poster) presented at the DAE-BRNS 7th National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials (PLD 2013) held at IIT Kharagpur, India November 14-16, 2013.
- One day orientation workshop on "Best Teaching Practices" at Central University of Rajasthan.
- **A. K. Patra**, "Magnetoresistance study of tailored magnetic nanocontact" International symposium on Science of Clusters, Nanoparticles and Nanoscale materials (**SOCNAM-2013**) organized by Department of Physics, Central University of Rajasthan at Holiday Inn **Jaipur** 4th-7th March 2013.

### Academic Visit/Stay:

Academic visit to **Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden), Germany** i) 19<sup>th</sup> September to 11<sup>th</sup> October 2015 & ii) 1<sup>st</sup> June to 15<sup>th</sup> July 2017 to carry out collaborative research work on magnetic thin films.

### Research Funding:

- 1) Magnetic and transport properties of Cr based thin films (Funding agency: **UGC, New Delhi**).
- 2) Structural and magnetic properties of TM based thin films with perpendicular magnetic anisotropy for spintronic applications (Funding agency: **SERB, DST New Delhi**).
- 3) Effect of swift heavy ion irradiation on the magnetic and transport properties of Huesler alloys (Funding agency: **IUAC New Delhi**).
- 4) Probing electronic structure of Cobaltite thin films (**UGC-DAE Indore**)
- 5) Rare-earth free intermetallic compounds to develop a new generation of high-performance Permanent Magnets (Co-Pi: **submitted to Ministry of Mines**)

### Collaboration:

- 1) Dr. V. Neu & Dr. S. Faehler, IFW Dresden. Germany
- 2) Dr. M. Vasundhara, NIIST Thiruvananthapuram, Kerala
- 3) Dr. R. J. Choudhary, UGC-DAE Indore
- 4) Dr. J Arout Chelvane, DMRL Hyderabad

### Selected Publications:

- Shivani Agarwal, S. A. Hashmi, Bhanu Nandan, **Ajit Kumar Patra**, Ravi Prakash Singh, J. Arout Chelvane, Manvendra Singh Khatri Structure and magnetic properties of electrodeposited CoPtP/Pt multilayers nanowires [Chemical Physics Letters](#) (accepted: available online) doi: <http://dx.doi.org/10.1016/j.cplett.2017.07.018>
- Surendra Kumar, Indrani Coondoo, M. Vasundhara, **Ajit K. Patra**, A. L. Kholkin and Neeraj Panwar "Magnetization reversal behavior and magnetocaloric effect in SmCr<sub>0.85</sub>Mn<sub>0.15</sub>O<sub>3</sub> chromites" [Journal of Applied Physics](#) **121**, 043907 (2017) Impact factor: 2.185 DOI: <http://dx.doi.org/10.1063/1.4974737>
- Nils Richter, Yenny R. Hernandez, Sebastian Schweitzer, June-Seo Kim, **Ajit Kumar Patra**, Jan Englert, Ingo Lieberwirth, Andrea Liscio, Vincenzo Palermo, Xinliang Feng, Andreas Hirsch, Klaus Müllen and Mathias Kläui "Robust two-dimensional electronic properties in three-dimensional microstructures of rotationally stacked turbostratic graphene" [Physical Review Applied](#) **7**, 024022 (2017) Impact factor:4.061, DOI: 10.1103/PhysRevApplied.7.024022
- Truptimayee Sahu, **Ajit K Patra** and Banarji Behera, "Effect of Gadolinium Doping on Physical Properties of 0.8BiGdxFe1-xO3-0.2PbTiO3 (x=0.00, 0.05, 0.10, 0.15 and 0.20) Composites" [Journal of Alloys and Compounds](#) **695**, 2273 (2017). Impact factor:3.014, DOI: <http://dx.doi.org/10.1016/j.jallcom.2016.11.084>
- P.Vats, D. Chauhan, **A. K. Patra**, V. P. Gupta and Alimuddin, "Ion beam induced structural and lectrical modifications of Fe doped molybdenum oxide thin films" [Materials Science in Semiconductor Processing](#) **31**, 593 (2015). Impact factor:2.264 , DOI: <http://dx.doi.org/10.1016/j.mssp.2014.12.041>
- **A. K. Patra**, F. Fleischhauer, S. Oswald, L. Schultz and V. Neu "Coercivity mechanism in hard magnetic SmCo<sub>5</sub>/PrCo<sub>5</sub> bilayers" [Journal of Physics D- Applied Physics](#) **47**, 215001 (2014). Impact factor:2.6521 , DOI:10.1088/0022-3727/47/21/215001

- S. Singh, **A. K. Patra**, B. Barin, E. del Barco and B. Özyilmaz “*Spin Pumping in Permalloy/Graphene and Permalloy/Graphite Interfaces*” [IEEE Transactions on Magnetics](#) **49 (7)**, 3147-3150 ( 2013).  
Impact factor:1.213 , DOI: 10.1109/TMAG.2013.2244067
- Arndt von Bieren, **Ajit K. Patra**, Stephen Krzyk, Jan Rhensius, Laura Heyderman, Regina Hoffmann-Vogel and Mathias Kläui “*Domain-wall induced large magnetoresistance effects at zero applied field in ballistic nanocontacts*” [Physical Review Letters](#) **110**, 06723 (2013).  
Impact factor:7.728, DOI: <http://dx.doi.org/10.1103/PhysRevLett.110.067203>
- **A. K. Patra**, S. Singh, B. Barin, Y. Lee, J.-H. Ahn, E. del Barco E. R. Mucciolo and B. Oezylmaz “*Dynamic spin injection into chemical vapor deposited graphene*” [Applied Physics Letters](#) **101**, 162407 (2012).  
Impact factor:3.515 , DOI: 10.1063/1.4761932
- E. Stilp, J. Freudenberger, M. Seifert, **A. K. Patra**, S. Menzel, I. Mönch, L. Schultz, V. Neu “*Probing the anisotropy constants of SmCo<sub>5</sub> and PrCo<sub>5</sub> by Hall resistance measurements in pulsed high magnetic fields up to 50 T*” [Journal of Magnetism and Magnetic Materials](#) **324**, 1711 (2012).  
Impact factor:2.002 , DOI: [10.1016/j.jmmm.2011.12.031](https://doi.org/10.1016/j.jmmm.2011.12.031)

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