

Personal details

Name: Somnath Dey

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Positions and academic qualifications

- 18/11/2024–present: P4F MSCA COFUND Postdoctoral Fellow at the Institute of Physics of the Czech Academy of Sciences, Prague, Czech Republic; Supervisor: Dr. Lukas Palatinus
- 01/11/2023–20/09/2024: Institute Postdoctoral Fellow at the Department of Chemistry, Indian Institute of Science Education and Research (IISER) Bhopal, Bhopal 462066, Madhya Pradesh, India; Supervisor: Prof. Dr. Deepak Chopra.
- 06/2023–09/2023: Guest lecturer of “Electrodynamics & Plasma Physics” at the Department of Physics, University of Kalyani, Kalyani, Nadia 741235, West Bengal, India
- 01.08.2020–31.01.2023: *Alexander von Humboldt* Postdoctoral fellow and teaching assistant at Institute of Crystallography, Division of Earth Sciences and Geography, RWTH Aachen University, Jägerstraße 17–19, 52066 Aachen, Germany; Supervisor: PD Dr. Lars Peters
- 02.05.2019–31.07.2020: Research and teaching assistant at Institute of Crystallography, Division of Earth Sciences and Geography, RWTH Aachen University, Jägerstraße 17–19, 52066 Aachen, Germany; Supervisor: Prof. Dr. Georg Roth
- 16.04.2018–25.04.2019: Postdoctoral fellow at Department of Chemical Sciences, Indian Institute of Science Education and Research (IISER) Kolkata, Mohanpur Campus, Mohanpur – 741246, West Bengal, India; Supervisor: Prof. Dr. Chilla Malla Reddy
- 31.12.2017–29.03.2018: Staff Scientist at Core Lab, KAUST, Thuwal, Saudi Arabia
- 13.04.2017–27.12.2017: Postdoctoral fellow at Department of Chemical Sciences, Indian Institute of Science Education and Research (IISER) Kolkata, Mohanpur Campus, Mohanpur – 741246, West Bengal, India; Supervisor – Prof. Dr. Chilla Malla Reddy
- March, 2011–February, 2017: Ph.D student at Laboratory of Crystallography, Department of Physics, University of Bayreuth, Germany; Supervisors – Prof. dr. Sander van Smaalen and PD. Dr. Andreas Schönleber; Ph.D degree awarded with distinction “Magna cum laude” on 23/02/2017
- 2010–2011: Junior Research Fellow at National Physical Laboratory, New Delhi, India
- 2008–2010: MSc. in Physics at Indian Institute of Technology Madras, Chennai, India. Passed with Cumulative Grade Point Average – 7.12 on 30/07/2010. Thesis Supervisor – Prof. Dr. P. N. Santhosh
- 2005–2008: BSc. in Physics at University of Calcutta; Physics (honours), Mathematics (pass), Chemistry (pass); Passed with marks – 66.25 % on 22/07/2008.

Research grants acquired as principal investigator

- **Title:** Investigation of spatially resolved phase information and chemical bonding of mechanically deformed molecular crystals using electron diffraction; **Agency:** Marie Skłodowska-Curie Actions (MSCA) – COFUND; **Amount:** 71,00,000 rupees approx.; **Fellowship type:** Postdoctoral; **Duration:** 18/11/2024–present.
- **Title:** Structure-mechanical response correlations of elastic molecular crystals as function of temperature, pressure and uniaxial strain; **Agency:** *Alexander von Humboldt* foundation; **Amount:** 90,00,000 rupees approx.; **Fellowship type:** Postdoctoral; **Duration:** 08/2020 – 01/2023
- **Title:** Probing structural strain in elastically bendable molecular single crystals; **Agency:** Science and Engineering Research Board (SERB), Department of Science and Technology (DST) Government of India; **Amount:** 19,20,000 rupees; **Fellowship type:** National Postdoctoral Fellowship; **Duration:** 03/2019–02/2021 (money used from 03/2019 to 04/2019).

State of art techniques and software expertises

- Synthesis: In-situ crystallization, synthesis and crystallization of cocrystals using solvo-thermal reaction method, inorganic oxides/composites using high temperature solid state reaction method.
- High strain: Spatially resolved micro X-ray diffraction on bent crystals; hydrostatic pressure.
- Synchrotron: Single Crystal X-ray diffraction using four circle Kappa and Euler geometry diffractometers and MARCCD and Pilatus detectors at Petra III and Hasylab, DESY, Hamburg. Micro X-ray diffraction at Spring8, Japan.
- In-house diffractometers: MAR345 diffractometer with one circle (ϕ) rotation equipped with image plate detector, Huber four circle Euler geometry diffractometer equipped with single counter detector. Single crystal diffractometer equipped with microfocus radiation from Agilent (now Rigaku). Stoe diffractometer equipped with image plate detector. Powder X-ray diffractometers – D8 advance, Diffractometer X'Pert Pro (MILIDI)
- Software: *CrysAlisPro*, *EVAL15*, *APEX3*, *SHELXT*, *SUPERFLIP*, *JANA2006* and *SHELXL*.

Research field

Complex microscopic mechanism of phase transitions, aperiodic order, self-healing, plasticity and elasticity, malleability and ductility in crystalline materials.

- Chirality density wave, Transport property and phase transitions of polyphenyls.
- Structure and phase transitions of elastic crystals as function of pressure, temperature and uniaxial stress
- Mechanism of deformation of elastically bendable, plastically bendable and self-healing crystals.
- Staff Scientist at KAUST: Service crystallography.
- Ph.D thesis: Phase transitions in molecular compounds *viz* disorder to order, modulated to non-modulated with symmetry considerations and twinning as function of low temperature. Special emphasis on superstructures with multiple formula units in the asymmetric unit treated as commensurately modulated structures within (3+D)-dimensional superspace.

Teaching experience

- **Course:** Single crystal X-ray diffraction block course; **Type:** Block course (4-5 days/year); **Year:** 2020-2022; **Level:** Postgraduate; **Language:** English; **Role:** Course designer, lecturer, instructor for experiments and tutorials, examiner and evaluator.
- **Course:** Methods of Crystal growth; **Type:** Full semester practical course (summer term); **Year:** 2021; **Level:** Postgraduate; **Language:** English; **Role:** Evaluator.
- **Course:** Introduction to basic Crystallography; **Type:** Full semester theoretical course (winter term); **Year:** 2019-2021; **Level:** Undergraduate; **Language:** German; **Role:** Tutor, invigilator.
- **Course:** Seminar course in Geomaterials; **Type:** Full semester theoretical course (winter term); **Year:** 2019-2020; **Level:** Undergraduate and Postgraduate; **Language:** German and English; **Role:** Teacher, instructor, evaluator.
- **Course:** Diffraction of light from laser source using single slits and grating; **Type:** Full semester experimental course (winter and summer term); **Year:** 2011-2014; **Level:** Undergraduate; **Language:** German; **Role:** Instructor, evaluator.
- **Guidance, supervision and teaching with in-house and synchrotron single crystal X-ray diffraction facilities:** I planned, supervised, guided and taught doctoral students during single crystal X-ray diffraction experiments employing synchrotron radiation at DESY, Hamburg, Germany. In addition, I frequently I taught doctoral students experiments using single crystal X-ray diffractometer (IPDS 2 Stoe) employing in-house radiation.

Year-wise experience with experiments at Synchrotron facility

- 2022: 1 (principal investigator) at beamline BL40XU at Spring8, Japan. 1 (participant) at beamline P24, Petra III, DESY Hamburg, Germany.
- 2021: 2 (principal investigator) + 1 (participant) at beamline P24, Petra III, DESY Hamburg, Germany.
1 (principal investigator) at beamline BL40XU at Spring8, Japan.
1 (co-proposer) at beamline P02.2, Petra III, DESY Hamburg, Germany.
- 2020: 1 (principal investigator) at beamline P24, Petra III, DESY Hamburg, Germany.
1 (principal investigator) at beamline P02.2, Petra III, DESY Hamburg, Germany.
- 2012: 3 (participant) at Beamline F1 and D3, HASYLAB, DESY, Hamburg, Germany.
- 2011: 2 (participant) at Beamline F1, HASYLAB, DESY, Hamburg, Germany.

Awards, prize and honours

- MSCA-COFUND Fellowship for postdoctoral research; award date – 15.03.2024.
- Chairperson of “Complex aperiodic and disordered structures” in 31st Annual Meeting of the German Crystallographic Society (DGK), 2023.
- Young Scientist Award by the 5th International School on Aperiodic Crystals, Kutna Hora, Czech Republic, 2022.

- Bursary award by International Union of Crystallography (IUCr) for the 25th IUCr congress held at Prague, 2021.
- Alexander von Humboldt Fellowship for postdoctoral researchers, award date – 19.03.2020.
- National Postdoctoral Fellowship (N-PDF) awarded by Science and Engineering Research Board (SERB), project number: DST-SERB: PDF/2018/002502, award date – 01.02.2019.
- Bursary award by Department of Science and Technology (DST) India for International Union of Crystallography (IUCr) 2017 meeting at Hyderabad, India, 2017.
- Recipient of Research fellowship from CSIR as a JRF (Junior Research Fellow) from July, 2010 – January, 2011.
- Qualified for fellowship and lectureship in India via NET (National eligibility test) conducted by CSIR (Council for the scientific and industrial research) held in December, 2009 (All India Rank = 132), 2010.
- Qualified for GATE (Graduate Aptitude Test for Engineering intended for pursuing Ph.D thesis in India) in February, 2010 with 92.7 percentile, 2010.
- Qualified for JEST (Joint Entrance Screening Test intended for pursuing Ph.D thesis in India) in March, 2010 with 90 percentile, 2010.
- Qualified for JAM (Joint Admission Test intended for pursuing Master of science in premier universities and institutes in India) with AIR (All India Rank) = 145 in March, 2008.
- Qualified for AIEEE (All India Engineering Entrance Examination intended for pursuing Bachelor of engineering in premium engineering colleges in India) state rank = 561 in April, 2005.

Journal reviewer

CrystEngComm, Zeitschrift für Kristallographie, Acta Crystallographica B, Inorganic Chemistry, Journal of Molecular Structure

Membership

German Society for Crystallography (DGK)

Co-curricular activities

- Member of Pandua Volleyball unit.
- Actor, director at theatre and vocalist.

List of referees:

- [1] Prof. dr. Sander van Smaalen
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- [2] PD. Dr. Andreas Schönleber
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- [3] Prof. Dr. Georg Roth
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- [4] PD. Dr. Lars Peters
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- [5] Prof. Dr. Deepak Chopra
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I certify that the information given above is correct to the best of my knowledge

Date – 29/11/2024

Somnath Dey.

Signature