Anjani Kumar Maurya

Curriculum Vitae

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Research and Work Experiences

May 2021- Present **Postdoctoral Research Fellow**, *SLAC National Accelerator Laboratory, Stanford University, California, USA; Supervisor: Dr. Christopher J. Tassone*

- Multimodal and multiscale structural characterization of next generation polymeric functional materials.
- Mechanistic interrogation of catalysts and bio-catalysts on solid polymer interfaces for deconstruction by developing novel in-situ and operando X-ray scattering, spectroscopy and microscopy methods at reaction conditions

Nov 2015- Feb 2017 **Material Simulation Engineer (working student)**, *Package simulation team, Infineon Technologies AG, Neubiberg, Germany; Supervisor: Dr. Martin Niessner*

- Developed tools in MATLAB, python and MS excel to analyse measured data and to compare results from experiments and simulation
- Created materials database for package simulation team
- Provisioning of conversion scripts in python for material models for different simulation tools
- Developed material models using the finite element method (FEM) simulation tools like COMSOL Multiphysics and Ansys

May 2015- Aug 2015 **Summer Internship**, *Quantum Optoelectronic Group, Laboratoire Kastler Brossel-UPMC-ENS, Paris, France; Supervisors: Prof. Quentin Glorieux & Prof. Alberto Bramati*, Internship title: "Hybrid apparatus: Optical microfiber knot/loop resonator"

- Fabricated microfiber knot/loop resonator
- Developed MATLAB tools to control pulling stages and recorded the transmission spectra
- Device was intended to couple quantum dots into it, to study the light matter interactions

Education

Mar 2017- Feb 2021 **PhD in Biomedical Engineering**, *(graduated summa cum laude)*

- Center for X-ray Analytics, Swiss Federal Laboratories for Materials Science and Technology (Empa, ETH domain Lab), Switzerland
- ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland

Thesis title: "Multiscale structural decoding of fibers and designing responsive nanofibrous materials"
Supervisors: Prof. Alex Dommann & Prof. Martin Frenz; *Co-advisor:* Prof. Antonia Neels

Oct 2015- Nov 2016 **MSc. (M2): Applied and Engineering Physics, Erasmus Mundus Master's Program in Material Science Exploring Large Scale Facilities (MaMaSELF)**

- Department of Physics, Technical University of Munich (TUM), Germany

Thesis title: "Optimization of the thermoelectric properties of conducting polymer thin films by dedoping and hybrid approaches"
Supervisor: Prof. Peter Müller Buschbaum

Sep 2014- Aug 2015 **MSc. (M1): Physics, Erasmus Mundus Master's Program in Material Science Exploring Large Scale Facilities (MaMaSELF)**

- Department of Phsyics, University of Rennes 1, France
  Mentor: Prof. Sergio Di Matteo

Jul 2010- Jun 2014 **Bachelor of Technology (B.Tech) in Engineering Physics**
- Indian Institute of Technology Guwahati (IITG), India

Thesis title: "Fabrication and characterization of silicon ultra-thin film prepared by Hot Wire Chemical Vapor Deposition (HWCVD) technique"
Supervisor: Prof. Pratima Agarwal

Publications and Conferences

The list of peer reviewed publications and conferences are attached at the end of this CV [See here], Google Scholar, and ResearchGate.

Awards and Honors

July-2022 Young Scientist Award to attend SAS2022 international conference in Brazil

May-2020 IUCr Young Scientist Award

Sept-2018 Best poster presentation award at EXCITE Biomedical Imaging Summer School, ETH Zurich, Switzerland

2015-2016 Erasmus+ Scholarship by the European Union

2014-2015 World Quantitative and Science Scholarship by World Quant Foundation

2012-2014 IIT Guwahati Institute Merit-cum-Means (McM) Scholarship by Government of India

2010 Ranked among the top 0.1% out of about 1 million candidates in Indian Institute of Technology Joint Entrance Examination (IIT-JEE 2010)

Skills

Computer Skills

Programming Language: Matlab, Python, C
OS: Windows, Linux, Mac OS
Software Tools: Ansys, Fusion 360, TOPAS, GSAS-II, ATSAS, NIKA, FIT2D, GIXGUI, DPDAK

Experimental Skills

Synthesis: Fiber fabriction techniques such as electropsinning and meltspuning, microfluics synthesis of nanoparticles, spin coating, 3D-prinitng, thin film deposition techniques such as Hot wire chemical vapor deposition, evaporation
Materials Characterisation: SEM, FIB-SEM, Cryo-TEM, Optical Microscopy, SAXS, XRD, Mechanical, Electrical and Optical characterisations
Simulation: Finite Element Simulation, Density Functional Theory (DFT), Molecular Dynamics

Organizational/Managerial Skills

- Managing the interdisciplinary BOTTLE project
- Chaired a session at the SAS2022 International conference
- Collaborated with research groups from around the world on various research projects
- Volunteered at the 1st Bio-X Conference in St. Gallen, Switzerland in May 2018
- Volunteered at the 5th International Conference on Solar Technology (SolTech) in Munich, Germany in April 2016
- Served as a city representative for TECHNOTHLON in 2011, an international school championship organized by the students of IIT Guwahati in India
- Volunteered at the 2nd International Conference on Advanced Nanomaterials and Nanotechnology (ICANN) in India in 2011

Languages
Hindi (native), English (native), German (A2), French (A2)

Teaching, Supervision and Support

- Taught "Applied Biomaterials" to University of Bern Master's students with Prof. Alex Dommann
- Supervised master's thesis of Ms. Eloise Mias (MaMaSELF and University of Rennes 1, 2020) titled "Decoding multiscale structural insights into electrospun fibers: from fabrication to possibilities for steering properties"
- Aided Prof. Alex Dommann in administering course work and examinations at the University of Bern
- Provided maintenance, user training, and technical support for SAXS/WAXS instruments (Molmet and Nanostar)
- Developed a microfluidics setup and provided training and technical support to users
- Designed and executed in-situ experimental setups for users, including tensile, heating, microfluidics, and humidity experiments coupled with SAXS/WAXS instrumentation

Memberships

2019-present	Member of Swiss Crystallography Society
2017-present	Member of Swiss Chemical Society
2015-2018	Member of German Physical Society (DPG)

References

Dr. Christopher J. Tassone
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SLAC National Accelerator Laboratory
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Menlo Park, CA 94025, USA
Phone: +1 (650) 926-3124
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Prof. Dr. Alex Dommann
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Prof. Dr. Antonia Neels
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Prof. Dr. Martin Frenz
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Publications

19. **Anjani K. Maurya**, Arun S. Asundi, Amani M. Ebrahim, Kevin P. Sullivan, Joel Miscall, Gregg T. Beckham, Christopher J. Tassone; "Unveiling the Role of Solvent and Catalyst in Plastic Autoxidation Deconstruction using X-Ray Scattering Techniques" *(about to submit).*

18. Arun S. Asundi, Amani M. Ebrahim, **Anjani K. Maurya**, Chad T. Palumbo, Kevin P. Sullivan, Gregg T. Beckham, Ritimukta Sarangi; "Effect of Ligand Chemistry on Electronic Properties and Reactivity of Cobalt Acetate Autoxidation Catalysts" *(Submitted).*

17. Makenna L. Pennel, **Anjani K. Maurya**, Amani M. Ebrahim, Christopher J. Tassone, Matteo Cargnello; "Intrinsic activity of silica-alumina for the conversion of polyethylene into tunable aromatics below pyrolytic temperatures" *(Submitted).*

16. Fernando Vazquez Luna, **Anjani K. Maurya**, Juliana Martins de Souza e Silva, Guido Dittrich, Theresa Paul, Dirk Enke, Patrick Huber, Ralf Wehrspohn, and Martin Steinhart; "Straight versus Spongy: Effect of Tortuosity on Polymer Imbibition into Nanoporous Matrices Assessed by Segmentation-Free Analysis of 3D Sample Reconstructions" *The Journal of Physical Chemistry C*, 126 (30), 12765-12779, (2022) DOI:10.1021/acs.jpcc.2c01991

15. Deeptanshu Sivaraman, Gilberto Siqueira, **Anjani K. Maurya**, Shanyu Zhao, Matthias M. Koebel, Gustav Nyström, Marco Lattuada, Wim J. Malfait; "Superinsulating nanocellulose aerogels: Effect of density and nanofiber alignment" *Carbohydrate Polymers*, Volume 292, 119675, ISSN 0144-8617, (2022) DOI:10.1016/j.carbpol.2022.119675

14. J. Schoeller, J. T. Avaro, **Anjani K. Maurya**, R. M. Rossi, A. Neels; "Tailoring Fibre Structure Enabled by X-ray Analytics for Targeted Biomedical Applications"; *Chimia* 2022, 76, 229 (2022) DOI:10.2533/chimia.2022.229

13. Robin M. Cywar, Nicholas A. Rorrer, Heather B. Mayes, **Anjani K. Maurya**, Christopher J. Tassone, Gregg T. Beckham, and Eugene Y.-X. Chen ; "Redesigned Hybrid Nylons with Optical Clarity and Chemical Recyclability"; *Journal of American Chemical Society*, 144, 12, 5366–5376, (2022) DOI:10.1021/jacs.1c12611

12. Iranpour, N., Liebi, M., Ong, Q., Blanchet, C., **Anjani K. Maurya**, Stellacci, F., Salentinig, S., Wick, P., Neels, A., "In-situ Investigations on Gold Nanoparticles Stabilization Mechanisms in Biological Environments Containing HSA"; *Advanced Functional Materials*, 32, 2110253, (2022) DOI:10.1002/adfm.202110253

11. **Anjani K. Maurya**, Eloise Miase, Jean Scholler, Giuseppino Fortunato, René M. Rossi, Alex Dommann, Antonia Neels*; "Multiscale structural decoding of electrospun fibers: from fabrication to possibilities for steering properties"; *Nanoscale Advances*, 4, 491-501, (2022) DOI:10.1039/D1NA00503K

10. Inès Richard, **Anjani K. Maurya**, Shahrzad Shadman, Eloïse Masquelier, Lison Sylou Marthey, Antonia Neels and Fabien Sorin: "Unraveling the influence of polymer chain orientation on the thermo-mechanical properties of thermally drawn fibers", *Small*, 18, 2101392 (2022) DOI:10.1002/smll.202101392

9. **Anjani K. Maurya**, Annapaola Parrilli, Tatiana Kochetkova, Jakob Schwiedrzik, Alex Dommann, Antonia Neels*; "Multiscale and multimodal X-ray analysis: Quantifying phase orientation and morphology of mineralized turkey leg tendons", *Acta Biomaterialia*, Volume 129, Pages 169-177, ISSN 1742-7061, (2021) DOI:10.1016/j.actbio.2021.05.022

8. **Anjani K. Maurya**, Sumit Mondal, Dean E. Wheeldon, Jean Scholler, Michel Schmid, Simon Annaheim, Martin Camenzind, Giuseppino Fortunato, Alex Dommann, Antonia Neels, Amin Sadeghpour, René M. Rossi; "Effect of radiant heat exposure on structure and mechanical properties of thermal protective fabrics"; *Polymer*, Volume 222, 123634, ISSN 0032-3861, (2021) DOI:10.1016/j.polymer.2021.123634

7. Dambarudhar Parida, Khalifah Salmeia, Amin Sadeghpour, Shanyu Zhao, **Anjani K. Maurya**, Eva Moreau, Robin Pauer, Sandro Lehner, Milijana Jovic, Sabyasachi Gaan; "Template free synthesis of hybrid mesoporous silica nanoparticle with phosphonic acid functionality for efficient methylene blue removal"; *Materials and design*, Volume 201, 109494, ISSN 0264-1275, (2021) DOI:10.1016/j.matdes.2021.109494

6. Ivana Malagurski, Ruggero Frison, **Anjani K. Maurya**, Antonia Neels, Boban Andjelkovic, Ramsankar Senthamaraikannan, Ramesh Babu padamati, kevin O Connor, Tomasz Witko, Daria Solarz, Jasmina Nikodinovic-Runic*; "Polyhydroxyoctanoate Films Reinforced with Titanium Dioxide Microfibers for Biomedical Application"; *Materials Letters*, Volume 285, 15 February, 129100 (2020) DOI:10.1016/j.matlet.2020.129100

5. Tatiana Kochetkova*, Cinzia Peruzzia Oliver Braun, Jan Overbeck, **Anjani K. Maurya**, Antonia Neels, Michel Calame, Johann Michler, Philippe Zysset, Jakob Schwiedrzik*; "Combining polarized Raman spectroscopy and micropillar compression to study microscale structure-property relationships in mineralized tissues", *Acta Biomaterialia*, issn 1742-7061 (2020), DOI:10.1016/j.actbio.2020.10.034

4. Tien N. D., **Anjani K. Maurya**, G. Fortunato, M. Rottmar, R. Zboray, R. Erni, A. Dommann, R. M. Rossi, A. Neels, A. Sadeghpour *; "Responsive Nanofibers with Embedded Hierarchical Lipid Self-Assemblies", *Langmuir*, 36, 40, 11787–11797 (2020), DOI:10.1021/acs.langmuir.0c01487

3. Arushi Jain, **Anjani K. Maurya**, Leonie Ulrich, Michael Jaeger, René M. Rossi, Antonia Neels, Philippe Schucht, Alex Dommann, Martin Frenz, and H. Günhan Akarçay, "Polarimetric imaging in backscattering for the structural characterization of strongly scattering birefringent fibrous media", *Opt. Express* 28, 16673-16695 (2020), DOI: 10.1364/OE.390303

2. **Anjani K. Maurya**, Lukas Weidenbacher, Fabrizio. Spano, Giuseppino Fortunato, René M. Rossi, Martin Frenz, Alex Dommann, Antonia Neels*, Amin Sadeghpour*; "Structural insights into semicrystalline states of electrospun nanofibers: a multiscale analytical approach" *Nanoscale* 11, 7176-7187 (2019), DOI:10.1039/C9NR00446G

1. Nitin Saxena, Josef Keilhofer, **Anjani K. Maurya**, Giuseppino Fortunato, Jan Overbeck, Peter Müller-Buschbaum*; "Facile Optimization of Thermoelectric Properties in PEDOT: PSS Thin Films through Acido-Base and Redox Dedoping Using Readily Available Salts"; *ACS Appl. Energy Mater.* 1, 2, 336-342 (2018), DOI: 10.1021/acsaem.7b00334

Conference proceedings

5. **Anjani K. Maurya**, Dommann, A. Neels; "Multiscale structural decoding of fibrous materials by SAXS and WAXD", Acta Cryst. (2021). A77, C571 DOI: 10.1107/S0108767321091236

4. **Anjani K. Maurya**, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann, A. Sadeghpour and A. Neels; "Multiscale structural decoding of electrospun nanofibres: from processing to possibilities for steering functionality", Acta Cryst. (2019). A75, e647 DOI: 10.1107/S2053273319089095

3. Amin Sadeghpour, Tien N. D., **Anjani K. Maurya**, G. Fortunato, A. Dommann, R. M. Rossi and A. Neels; "Hierarchical design of lipid–polymer composite nanofibres: the interplay of multiscale structures and biofunctions". Acta Cryst. (2019). A75, e587. DOI: 10.1107/S2053273319089691

2. Malagurski, R. Frison, **Anjani K. Maurya**, J. Nikodinovic-Runic, R. Babu, K.E. O'Connor, A. Neels; "Medium chain length (mcl)-PHA-based nanocomposites for biomedical applications: system evaluation through XRD", Acta Cryst. (2019). A75, e577. DOI: 10.1107/S2053273319089794

1. Arushi Jain, **Anjani K. Maurya**, Alex Dommann, Antonia Neels, Martin Frenz, and H. Günhan Akarçay "Polarimetric imaging of the light backscattered from multiply scattering nanofibrous PVDFhfp scaffolds", Proc. SPIE 10890, Label-free Biomedical Imaging and Sensing (LBIS) 2019, 108900E (13 March 2019); DOI: 10.1117/12.2507399

Conference Presentations

23. **Anjani K. Maurya**, Arun S. Asundi, Sarah A. Hesse, Amani M. Ebrahim, Kevin P. Sullivan, Chad T. Palumbo, Allison Z. Werner, Christopher J. Takacs, Gregg T Beckham, Ritimukta Sarangi, Christopher J. Tassone; " Decoding the mechanism of autoxidation deconstruction reaction of plastics by in-situ simultaneous SAXS and WAXS"; September 2022, SAS2022 Internation Confernece, Campinas, Brazil. (Talk)

22. **Anjani K. Maurya**, René M. Rossi, Alex Dommann, Antonia Neels*; "Unraveling the multiscale structure of fibrous materials by X-ray scattering techniques"; May-June 2022, European Powder Diffraction Conference, EPDIC17, Šibenik, Croatia

21. **Anjani K. Maurya** Eloïse Mias, Jean Schoeller, René M. Rossi, Martin Frenz, Alex Dommann, Antonia Neels; "Multiscale structural decoding of electrospun fibers: from processing to possibilities for steering properties"; 30 November 2020; Empa PhD symposium 2020, Empa, St. Gallen, Switzerland

20. **Anjani K. Maurya**, Amin Sadeghpour, Ruggero Frison, Riccardo Malini Innocenti, Claudio Toncelli, Marc G. Willinger, René M. Rossi, Martin Frenz, Alex Dommann, Antonia Neels*; "Nucleation and growth study of Iron oxide nanoparticles from Solution for biomedical application"; Poster presentation delivered at GCB Symposium

2020, January 2020, University of Bern, Switzerland

19. **Anjani K. Maurya**, Amin Sadeghpour, Ruggero Frison, Riccardo Innocenti Malini, Claudio Toncelli, Marc G. Willinger, René M. Rossi, Martin Frenz, Alex Dommann, Antonia Neels; "Nucleation and growth study of Iron oxide nanoparticles from Solution". Poster presentation delivered at Empa PhD symposium, Switzerland, November 2019

18. Sadeghpour, N. D. Tien, **Anjani K. Maurya**, G. Fortunato, A. Dommann, R. M. Rossi, A. Neels; "Structure and Dynamics in the Newly Designed Polymer Nanofibers with Embedded Lipid Mesophases". Oral presentation delivered at SAXS Excites 2019, University of Graz, Austria. 2019

17. N. D. Tien, **Anjani K. Maurya**, Z. Robert, Giuseppino Fortunato, M. Rottmar, Giuseppino Fortunato, René M. Rossi, Martin Frenz, Alex Dommann, Antonia Neels,and Amin Sadeghpour; "Electrospun nanofobers with embedded bioinspired membranes". Poster presentation at Bioinspired materials, Monte Verità October 2019

16. **Anjani K. Maurya**, Lukas Weidenbacher, Fabrizio Spano, Giuseppino Fortunato, René M. Rossi, Martin Frenz, Alex Dommann, Amin Sadeghpour, and Antonia Neels; "understanding fiber fabrication process by structural feedbacks by SAXS and WAXD" Poster presentation at European Crystallography meeting, , University of Vienna, 21-22. August. 2019

15. **Anjani K. Maurya**, Lukas Weidenbacher, Fabrizio Spano, Giuseppino Fortunato, René M. Rossi, Martin Frenz, Alex Dommann, Amin Sadeghpour, and Antonia Neels; "Decoding structural insights of nanofibers by SAXS and WAXD". Oral presentation delivered at Swiss Crystallography meeting, EPFL Sion Switzerland, August 2019

14. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Decoding structural Insights into semicrystalline states of polymeric nanofibers at nanoscale". Poster presentation delivered at Empa PhD symposium November 2018

13. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Structural-morphological correlation studies in polymeric nanofibers by SAXS and WAXD". Poster presentation delivered at Polycoll 2018, EPFL, Switzerland October 2018

12. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Study the effect of nanofiber fabrication processes into the modification of internal structure at nanoscale", Poster presentation delivered at Swiss Crystallography meeting-2018, PSI, Switzerland September 2018

11. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Structural Insights into Semicrystalline States of Electrospun Nanofibers" September 2018.Poster presentation delivered at EXCITE Biomedical Imaging Summer School 2018, ETH Zurich, Switzerland. (Best Poster Award)

10. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Structure-morphology correlation studies of electrospun nanofibers by SAXS and WAXS" Poster presentation delivered at Bio-X, Empa St. Gallen, Switzerland, March 2018

9. **Anjani K. Maurya**, A. Sadeghpour, L. Weidenbacher, F. Spano, G. Fortunato, R. M. Rossi, M. Frenz, A. Dommann and A. Neels. "Structural in-situ studies for particle system synthesis and their early event dynamics in bio environments". Oral presentation, Empa PhD seminar, Empa St. Gallen, Switzerland, January 2018

8. **Anjani K. Maurya**, A. Sadeghpour, R. Rossi, A. Dommann, A. Neels. "Structure-morphology correlation studies in electrospun nanofibers by SAXS and WAXS". Oral presentation, Empa PhD symposium-2017, Dubendorf, Switzerland, November 2017

7. **Anjani K. Maurya**, A. Sadeghpour, R. Rossi, A. Dommann, A. Neels. "Structural analysis of electrospun fiber membrane by SAXS and WAXS". Oral Presentation, Swiss Crystallography meeting -2017 Geneva, Switzerland, September 2017

6. **Anjani K. Maurya**, N. Saxena and P. Müller-Buschbaum, "In-plane and cross-plane Seebeck coefficients in organic thermoelectric thin films", 6th Energy Colloquium of the Munich School of Engineering, TUM, Germany, July 2016

5. **Anjani K. Maurya**, N. Saxena, and P. Müller-Buschbaum, "Enhancement of Seebeck coefficient by dedoping of conducting polymer", Summer school, Austria, June 2016

4. **Anjani K. Maurya**, N. Saxena, P. Müller-Buschbaum, "Hybrid Based Thermoelectrica", MaMaSELF status meeting, oral presentation, Rigi Kulm, Switzerland, May 2016

3. **Anjani K. Maurya**, N. Saxena, P. Müller-Buschbaum, "Hybrid Based Thermoelectrica", Poster presentation, The German Physical Society (German: Deutsche Physikalische Gesellschaft, DPG) meeting 2016, Regensburg, Germany, March 2016

2. **Anjani K. Maurya**, "Band gap variation in bilayer graphene and silicene under transverse electric field", Poster presentation, International Conference on Advance Nanomaterials and Nanotechnology (ICANN-2013), IIT Guwahati, India, December 2013

1. Lalhriatzuala, **Anjani K. Maurya**, Pratima Agarwal,"Structural and transport studies of ZnS thin film prepared by Doctor Blade's technique", Poster Presentation, Condensed Matter Days Conference 2011, Guwahati University, India, August 2011