Lucas Kreuzer

Postdoctoral researcher

Institute of Materials Physics in Space (DLR) and Neutron Source MLZ (FRM II)

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German

About Me

I am curious about new things – No matter how small, large, near or far away they are. I am a formally trained academic scientist with exposure of working within diverse teams in creative team-building and leading roles. I enjoy understanding how seemingly unrelated domains are unified, and currently I am digging into the wondrous world of emerging technologies such as machine learning and artificial intelligence.

Social Network

Connect with me on LinkedIN

and find me on Research Gate

or on Twitter

Languages

- German
- English
- French
- Spanish
- Python

Professional Experience

since 06/2021 — **Postdoctoral researcher @ DLR Cologne & MLZ (FRM II) Munich**
Dynamic/Structure relationship in liquid metal alloys (sometimes in micro-gravity environment) via neutron and x-ray scattering techniques

since 03/2021 — **Scientific Editor and Translator (freelance) @ CACTUS Communication**
Editor of STEM papers, such that the final text is free of unclear or unidiomatic sentences

since 11/2018 — **Science Consultant and Content Creator @ Kurzgesagt GmbH**
Fact checker, last instance of quality assurance, and script/idea creator for videos, scripts, apps, references, and translations of socio-scientific topics for creative public outreach.

since 2017 — **Peer-Reviewer @ American Chemical Society (ACS)**
Provision of written, unbiased, and constructive feedback on the scholarly merits and the scientific value of unpublished manuscripts submitted mainly (30+) to ACS journals (Appl. Mater. & Inter., Langmuir, Omega, J. Coll. & Inter. Sci.).

11/2016 – 04/2021 — **Doctoral researcher @ Chair of Functional Materials, TUM (Summa cum laude)**
Is it possible to build smart and reliable devices for sensoric or soft-robotic applications? – Investigated and demonstrated control over response of polymer thin films to multiple sensory stimuli with advanced neutron characterization methods.
How do we realize stable and/or changing environmental conditions at large scale neutron facilities, where space and time are scarce? – Designed, developed and deployed experimental infrastructure for the international scientific-engineering community in the form of a versatile sample environment to systematically control external stimuli.

04/2013 – 03/2016 — **Scientific Assistant @ Chair of Physical Chemistry, University of Bayreuth**
How do enzyme-coated metal nanoparticles behave under changing environmental parameters? Can we reproducible fabricate stable NP@enzyme/protein colloids of various size and shapes? – Established a one-pot nanoparticle (NP) syntheses and their functionalization with various enzymes and proteins of biomedical relevance.

Education

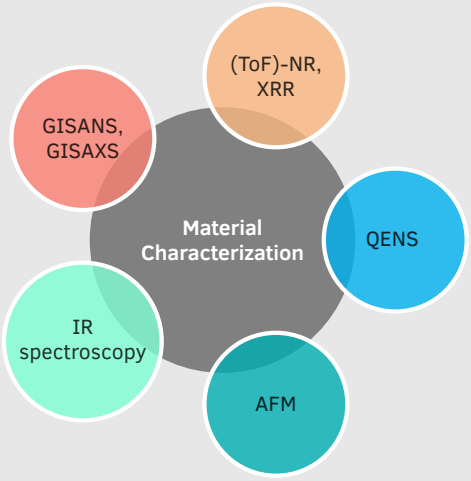
10/2013 – 03/2016 — **Master Studies @ Chair of Physical Chemistry, University of Bayreuth ($\varnothing$ 1.3)**
Is it possible to use immobilized enzymes as catalyst for controlled polymerization and re-win the catalyst once the polymerization has finished? – Synthesized metal (Ag, Au) and magnetic metal oxide (Fe_3O_4) nanoparticles and functionalized them with enzymes for enzyme-mediated and controlled polymerization reactions.
Master Thesis: Enzyme-coated gold nanoparticles as catalyst for ATRP controlled polymerization

09/2014 – 04/2015 — **Research Fellowship @ Department of Chemical and Biomolecular Engineering, Lafayette College, USA)**
Will we reveal the mechanisms behind the aggregation behavior of hybrid organic/inorganic colloids? – Investigated the colloidal stability of immobilized enzymes on metal and metal oxide nanoparticles upon changing physico-chemical parameters.

10/2010 – 09/2013 — **Bachelor Studies @ Chair of Physical Chemistry, University of Bayreuth ($\varnothing$ 2.1)**
What impact does the immobilization of enzymes have on their catalytic properties? – Explored and devised new routes to establish polymerization reactions mediated by immobilized enzymes.
Bachelor Thesis: Dual-responsive protein/polymer nanosystems

Hard Skills

- Polymer science
- Neutron scattering
- Material characterization
- Synthesis



Soft Skills

- Being a mentor
  - Supervision of several BA/MA theses, working students and tutorials
- Living inter-disciplinarity
  - Proactive collaborating with different disciplines on a daily basis
- Get the job done
  - Skilled at leading large groups in challenging collaborative projects under time/resource limited condition
- Science communicator
  - Communicating science to non-professionals via social media, podcasts, and my webpage

References

Peter Müller-Buschbaum
Chair of Functional Materials, TUM

James K. Ferri
Department of Chemical and Life Science Engineering at VCU, USA

Munish Chanana
Chair of Wood Based Materials, ETH Zürich, CHE

Key Publications

01/2021	*Salt-Dependent Phase Transition Behavior of Doubly Thermoresponsive Poly(sulfobetaine)-Based Diblock Copolymer Thin Films*, **Langmuir**, 2021, 37, 30, 9179–9191
01/2021	*Solvation Behavior of Poly(sulfobetaine)-Based Diblock Copolymer Thin Films in Mixed Water/Methanol Vapors*, **Macromolecules**, 2021, 54, 15, 7147–7159
01/2021	*Poly(sulfobetaine) versus Poly(N-isopropylmethacrylamide): Co-Nonsolvency-Type Behavior of Thin Films in a Water/Methanol Atmosphere*, **Macromolecules**, 2021, 54, 3, 1548–1556
10/2020	*Cyclic Water Storage Behavior of Doubly Thermo-responsive Poly(sulfobetaine)-Based Diblock Copolymer Thin Films*, **Macromolecules**, 2020, 53, 20, 9108–9121
04/2020	*Phase Transition Kinetics of Doubly Thermoresponsive Poly(sulfobetaine)-Based Diblock Copolymer Thin Films*, **Macromolecules**, 2020, 53, 8, 2841–2855
04/2019	*Swelling and Exchange Behavior of Poly(sulfobetaine)-Based Block Copolymer Thin Films*, **Macromolecules**, 2019, 52, 9, 3486–3498
10/2017	*Enzymatic Catalysis at Nanoscale: Enzyme-Coated Nanoparticles as Colloidal Biocatalysts for Polymerization Reactions*, **ACS Omega**, 2017, 2, 10, 7305–7312

Research Communication

Conference Talks

2021	ACS Spring Meeting	Austin, TX (virtual ed.)
2019	European Conference of Neutron Scattering	St. Petersburg, RUS
2019	DPG Spring Meeting	Berlin, DEU
2019	Key talk @ 9th Colloquium of Munich School of Engineering (MSE) (1^{st} prize out of 15 talks)	Garching, DEU
2018	Macro18	Cairns, AUS
2018	Invited talk @ Edgar Lüscher Seminar	Klosters, CHE
2017	Flexiprobe Project Meeting with leading scientists on the future of designed instruments	Lund, SWE

Courses

02/2021	Advanced Collaboration	International Max Planck Research School
05/2019	Building Networks	Graduate School, TUM
11/2018	Efficiency Skills for Scientists	Graduate School, TUM
10/2017	Scientific Paper Writing	Graduate School, TUM

Extra-Curricular Activities

HAYAG	Ambassador of a Filipino child care project
SciComm	Host of the podcast 'YourFriendlyPhysicist and other NERDS', where I interview scientists about their research, challenges, and visions
Writing	Co-founder of an open-access, interdisciplinary, and community-curated online space called aknownspace
Music	Lead guitarist and singer of Neutronic Nomads. Slowly becoming a master guitar and amp builder
Sports	Getting a clear head while running (preferably long and slow)

January 19, 2023 **Lucas Kreuzer**