

Vivek Devulapalli, Ph.D.

Nunenenstrasse 38

3600, Thun, Switzerland 📞 +41-79572 0679

✉ vivek.devulapalli@empa.ch

🌐 <https://www.linkedin.com/in/vivek-devulapalli-stem/>

📄 <https://scholar.google.com/citations?user=TE3lrxoAAAAJ&hl=en>

🌐 <https://vivekdevulapalli07.github.io/website/>



Professional summary

I am an early-career postdoctoral researcher specializing in advanced electron microscopy with a materials science background. I employ aberration-corrected STEM to link atomic structure and composition to material properties across multiple length scales. My expertise includes multidimensional imaging, analytical techniques, STEM simulations, and correlative approaches for comprehensive material characterization.

During my PhD, I investigated the atomic-scale structure of grain boundaries in titanium, which led to high-impact publications. During my first postdoc at MPIE, I studied hydrogen embrittlement in additively manufactured alloys. In my second postdoc at EMPA, I focused on deformation mechanisms in structural and functional materials, including single crystals, additively manufactured alloys, and multilayered crystalline/amorphous materials. I am deeply committed to open science and science communication.

Scientific career

- | | |
|----------------|--|
| 2024 – Present | <div>■ Postdoctoral researcher, EMPA, Thun, Switzerland</div> <div>Project: <i>In-situ TEM tensile testing of crystalline-amorphous nanolayered materials</i></div> <div>SNSF proposal: <i>Grain boundary atomic scale mechanics in Ti (GRABIT)</i></div> <div>Innosuisse Project: <i>Quantized nanolaminates as industrial magnetron sputtering process</i></div> <div>PI: <i>Prof. Johann Michler, Dr. Xavier Maeder</i></div> |
| 2022 – 2024 | <div>■ Postdoctoral researcher, Max-Planck Institut für Eisenforschung, Düsseldorf, Germany</div> <div>DFG Project: <i>Mechanical properties and hydrogen tolerance of particle-reinforced CCA produced by additive manufacturing</i></div> <div>PI: <i>Prof. Gerhard Dehm, Prof. Eric Jägle</i></div> |
| 2018 – 2022 | <div>■ PhD, Max-Planck Institut für Eisenforschung, Düsseldorf, Germany</div> <div>Advanced transmission electron microscopy group, Department of structure and nano-/micromechanics of materials</div> <div>Thesis title: <i>Microstructure and grain boundary evolution in titanium thin films.</i></div> <div>Supervisor: <i>Prof. Gerhard Dehm</i>, Group leader: <i>Dr. Christian Liebscher</i></div> |
| 2016 – 2018 | <div>■ M.Tech., Indian Institute of Technology, Madras, India</div> <div>Metallurgical and materials engineering department</div> <div>Thesis title: <i>Correlative microscopy of Magnesium - rare-earth alloys.</i></div> <div>Thesis work performed as a DAAD exchange program at Materials Chemistry, RWTH Aachen, Germany with <i>Prof. Jochen Schneider</i></div> <div>Supervisors: <i>Prof. B S Murty, Prof. K G Pradeep</i></div> |
| 2012 – 2016 | <div>■ B.Tech., National Institute of Technology, Raipur, India in Metallurgical engineering</div> <div>CGPA: 9.22/10 (Honours)</div> |

Research Publications

First Author Publications

- 1 **Devulapalli, V.**, Schulz, F., Barreto, E. S., Ellendt, N., Jäggle, E. A., & Dehm, G. (2024). Laser powder bed fusion synthesis of nanoparticle reinforced cocrfeni. *Additive Manufacturing*, 91, 104338.
<https://doi.org/10.1016/j.addma.2024.104338>
- 2 **Devulapalli, V.**, Chen, E., Brink, T., Frolov, T., & Liebscher, C. (2024). Segregation induced grain boundary phase transition in titanium. *Science*, 386, 420–424.
<https://doi.org/10.1126/science.adq4147>
- 3 **Devulapalli, V.**, Hans, M., Sukumar, P. T., Schneider, J. M., Dehm, G., & Liebscher, C. (2022). Microstructure, grain boundary evolution and anisotropic fe segregation in (0001) textured ti thin films. *Acta Materialia*, 238, 118180. <https://doi.org/https://doi.org/10.1016/j.actamat.2022.118180>
- 4 **Devulapalli, V.**, Bishara, H., Ghidelli, M., Dehm, G., & Liebscher, C. (2021). Influence of substrates and e-beam evaporation parameters on the microstructure of nanocrystalline and epitaxially grown ti thin films. *Applied Surface Science*, 562, 150194.
<https://doi.org/https://doi.org/10.1016/j.apsusc.2021.150194>

Co-authored Publications

- 1 Lyrio, M., Oliveira, H., Sandim, M., Devulapalli, V., & Sandim, H. (2025). Effect of the scanning strategy on texture of grain-oriented electrical steel (fe-4wt. si) processed via laser powder-bed fusion and subsequent thermomechanical processing. *Materials Characterization*, 221, 114789.
<https://doi.org/10.1016/j.matchar.2025.114789>
- 2 Chatzopoulou, P., Hilliard, D., Vasileiadis, I. G., Florini, N., **Devulapalli, V.**, Liebscher, C. H., Lymperakis, L., Komninou, P., Kehagias, T., & Dimakis, E. (2025). Elastic limit and relaxation of gaas/in(al,ga)as core/shell nanowires for near-infrared applications [Focus on Nanowires 2023-24]. *Nanotechnology*, 36(9), 095703. <https://doi.org/10.1088/1361-6528/ad9d4a>
- 3 Senol, S., Li, G., **Devulapalli, V.**, Brodu, E., & Vanmeensel, K. (2024). High strength and fatigue performance achieved for l-pbf processed hybrid particle reinforced al-cu-mg composite. *Composites Part B: Engineering*, 285, 111736. <https://doi.org/10.1016/j.compositesb.2024.111736>
- 4 Dhekne, P. P., Vermeij, T., **Devulapalli, V.**, Jadhav, S. D., Hoefnagels, J. P., Geers, M. G., & Vanmeensel, K. (2023). Micro-mechanical deformation behavior of heat-treated laser powder bed fusion processed ti-6al-4v. *Scripta Materialia*, 233, 115505.
<https://doi.org/https://doi.org/10.1016/j.scriptamat.2023.115505>
- 5 Gärtner, E., Witte, A., Peter, N. J., **Devulapalli, V.**, Ellendt, N., Dehm, G., Jäggle, E. A., Uhlenwinkel, V., & Mädler, L. (2023). Melt pool signatures of tin nanoparticle dry-coated $Co_{25}Cr_{25}Fe_{25}Ni_{25}$ metal powder in laser-powder-bed-fusion. *Materials & Design*, 226, 111626.
<https://doi.org/https://doi.org/10.1016/j.matdes.2023.111626>
- 6 Vasileiadis, I. G., Lymperakis, L., Adikimenakis, A., Gkotinakos, A., **Devulapalli, V.**, Liebscher, C. H., Androulidaki, M., Hübner, R., Karakostas, T., Georgakilas, A., Komninou, P., Dimakis, E., & Dimitrakopoulos, G. P. (2021). Substitutional synthesis of sub-nanometer InGaN/GaN quantum wells with high indium content. *Scientific Reports*, 11(1), 20606. <https://doi.org/10.1038/s41598-021-99989-0>

Skills

Instruments with 5+ years

of hands-on experience



Thin film deposition, Material characterization on all length scales - XRD, SEM, EDS, EBSD, FIB, TEM, Multi-dimensional STEM techniques, APT.

Skills (continued)

Programming	Python - multidimensional microscopy data analysis and image processing (py4Dstem, hyperspy), image simulation (abTEM, prismatic), image processing (numpy, scikitimage), data visualization (mpl), L ^A T _E X.
Softwares	Digital-micrograph, Image-j, Ovito, Vesta, Photoshop, MS-Office.

Positions of Responsibility

Supervision and teaching experience

1. Supervised a Cambridge University summer intern for 8 weeks, 2023.
2. Peer-reviewed a full-length journal article for *Materialia*, 2023.
3. Delivered a lecture on 'grain boundaries' as part of a seminar series at MPIE, 2021.
4. Served as a teaching assistant under Prof. Ravi Shankar Kottada, IIT - Madras, 2016.

Leadership & Organization

1. Member of European Microscopy Society (EMS) and Deutsche Gesellschaft für Elektronenmikroskopie e.V. (DGE), 2019-present.
2. Internal PhD representative, 2019-2022.
3. Member of MPIE's sustainability team, 2021-2023.
4. Organized and participated in a teaching seminars and career planning seminar, 2021-2022.
5. Managed MPIE's Twitter account, 2020-2023.
6. Coordinated department weekly-seminars, 2022-23.
7. Managed a high-vacuum furnace, 2021-2023.






Science communication

1. Represented MPIE at the Bright World of Metals science slam event, 2023.
2. Organized and spoke at "Pint of Science," Düsseldorf, 2021 and 2023.
3. Represented MPIE at "Nacht-der-Wissenschaft (Science Night)," Düsseldorf, 2022.
4. Attended the **Alexander-von-Humboldt scholarship-funded** Science Communication Summer School in Berlin, 2021, resulting in a published *Declaration on the Future of Science Communication* presented to the German Parliament.
5. Editorial team member for the Max-Planck PhD-net scientific magazine, "Offspring," 2019-2020.

Awards and recognition


- **Granted travel support by European Microscopy Society** for MC-2021, Vienna.
- **DAAD IIT-Masters scholarship** for a 7 month research stay in RWTH-Aachen, Germany, 2017.
- Scored **All India Rank – 76** in Graduate Aptitude Test in Engineering in Material Science, 2016.
- Scored **All India Rank - 4** in Metallurgical Thermodynamics exam conducted by NPTEL, 2016.
- Secured ARCI Hyderabad summer internship through first-place presentation at IIT - BHU, 2015.
- Awarded as **Eminent student of the branch** by Humanities department, NIT – Raipur, 2015.

Conferences


- Poster  International Microscopy Conference (IMC20), South-Korea (2023)
Experimental observation of segregation induced grain boundary phase transition in titanium
- Talk  FEMS - Euromat, Frankfurt, Germany (2023)
Additively manufactured particle reinforced-CoCrFeNi: Microstructure, mechanical behaviour and hydrogen response.
- Poster  Microscopy Conference 2021, Vienna, Austria (Virtual) (2021)
Unravelling the atomic structure and segregation of Σ_{13} [0001] tilt grain boundaries in titanium by advanced STEM.
- Talk  MSE Darmstadt (Virtual), Darmstadt, Germany (2020)
Unravelling grain boundary structures in Ti thin films using aberration-corrected transmission electron microscopy.
- Poster  IAMNano, Düsseldorf, Germany (2019)
From epitaxially grown thin films to grain boundary analysis in Cu and Ti.

References


Prof. Dr. Gerhard Dehm

Director,
Department of structure and
nano-/ micromechanics of
materials,
MPIE, Düsseldorf
 dehm@mpie.de

Prof. Dr. Christian Liebscher

Professor of Advanced Transmis-
sion Electron Microscopy at the
Faculty of Physics and Astronomy
and the Research Center Future
Energy Materials and Systems (RC
FEMS),
Ruhr University Bochum
 christian.liebscher@rub.de

Prof. Dr. Johann Michler

Adjunct Professor, EPFL
Head of laboratory, Laboratory
for Mechanics of Materials and
Nanostructures,
EMPA, Thun
 johann.michler@empa.ch