

# Vivek Devulapalli, Ph.D.

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🌐 <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

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| 2024 – Present | <div style="display: flex; align-items: flex-start;"><div style="color: #800080; font-size: 1.2em; margin-right: 10px;">■</div><div><b>Postdoctoral researcher, EMPA, Thun, Switzerland</b><br/>Project: <i>In-situ TEM tensile testing of crystalline-amorphous nanolayered materials</i><br/>SNSF proposal: <i>Grain boundary atomic scale mechanics in Ti (GRABIT)</i><br/>Innosuisse Project: <i>Quantized nanolaminates as industrial magnetron sputtering process</i><br/>PI: Prof. Johann Michler, Dr. Xavier Maeder</div></div>         |
| 2022 – 2024    | <div style="display: flex; align-items: flex-start;"><div style="color: #800080; font-size: 1.2em; margin-right: 10px;">■</div><div><b>Postdoctoral researcher, Max-Planck Institut für Eisenforschung, Düsseldorf, Germany</b><br/>DFG Project: <i>Mechanical properties and hydrogen tolerance of particle-reinforced CCA produced by additive manufacturing</i><br/>PI: Prof. Gerhard Dehm, Prof. Eric Jägle</div></div>   |
| 2018 – 2022    | <div style="display: flex; align-items: flex-start;"><div style="color: #800080; font-size: 1.2em; margin-right: 10px;">■</div><div><b>PhD, Max-Planck Institut für Eisenforschung, Düsseldorf, Germany</b><br/>Advanced transmission electron microscopy group, Department of structure and nano-/micromechanics of materials<br/>Thesis title: <i>Microstructure and grain boundary evolution in titanium thin films.</i><br/>Supervisor: Prof. Gerhard Dehm, Group leader: Dr. Christian Liebscher</div></div>                               |
| 2016 – 2018    | <div style="display: flex; align-items: flex-start;"><div style="color: #800080; font-size: 1.2em; margin-right: 10px;">■</div><div><b>M.Tech., Indian Institute of Technology, Madras, India</b><br/>Metallurgical and materials engineering department<br/>Thesis title: <i>Correlative microscopy of Magnesium - rare-earth alloys.</i><br/>Thesis work performed as a <b>DAAD exchange program at Materials Chemistry, RWTH Aachen, Germany</b> with Prof. Jochen Schneider<br/>Supervisors: Prof. B S Murty, Prof. K G Pradeep</div></div> |
| 2012 – 2016    | <div style="display: flex; align-items: flex-start;"><div style="color: #800080; font-size: 1.2em; margin-right: 10px;">■</div><div><b>B.Tech., National Institute of Technology, Raipur, India</b> in Metallurgical engineering<br/>CGPA: 9.22/10 (Honours)</div></div>  |

## Research Publications

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## Skills

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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.

Programming

■ Python - multidimensional microscopy data analysis and image processing (py4Dstem, hyperspy), image simulation (abTEM, prismatic), image processing (numpy, scikitimage), data visualization (mpl),  $\text{\LaTeX}$ .

Softwares

■ Digital-micrograph, Image-j, Ovito, Vesta, Photoshop, MS-Office.

## Positions of Responsibility

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### 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

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- **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  $\Sigma_{13}$  [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  
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**Dr. Christian Liebscher**  
Group-leader,  
Advanced-transmission electron  
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