Dr.-Ing. Waseem Amin (PhD)

Professional Objective

I seek to continually contribute to the development and communication of scientific knowledge by learning and using the modern scientific tools and practices that can help us to improve our understanding of materials and disseminating the resulting broader impacts on the relevant stakeholders.

Educational Background

2016-2020	**PhD** (Micromechanical Modeling and Simulations of Advanced Materials) Chair of Micromechanical and Macroscopic Modelling (MMM) Interdisciplinary Center for Advanced Materials Simulations (ICAMS), Ruhr University Bochum, Bochum, Germany **Thesis** Micromechanical Modeling of Metals using Strain Gradient Crystal Plasticity coupled Phase-Field Model
2010-2012	**MSc.** (Nanotechnology and Materials Engineering) Ghulam Ishaq Khan Institute, Topi, Pakistan **Thesis** MWCNTs/AA6061 Surface Nanocomposites: Development using Friction Stir Processing and Characterization
2006-2010	**BSc.** (Metallurgical and Materials Engineering) University of Engineering and Technology, Lahore, Pakistan **Thesis** Friction Stir Welding of 2219-T6 Aluminum Alloy and Evaluation of their Mechanical and Microstructural Properties
2004-2006	**Higher Secondary School Certificate** (Pre-Engineering) Govt. College of Science, Wahdat Road, Lahore, Pakistan
2002-2004	**High School Certificate** (Science: Math. Chemistry, Physics, Biology) Govt. Gulberg High School, Lahore Cantt. Pakistan

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Professional Experience

Faculty Positions

2022-to date	**Assistant Professor** in Institute of Metallurgy and Materials Engineering, University of the Punjab, Lahore, Pakistan. **Responsibilities:** Teaching, research, students' coordination, innovation.
2021-2022	**Assistant Professor** in Abbottabad University of Science and Technology, Abbottabad, Pakistan. **Responsibilities:** Establishment of new Institute of Materials, Minerals and Mining Engineering (IMMME) in AUST.
2016-2020	**Research Assistant** in Ruhr University Bochum, Bochum, Germany **Responsibilities:** Research on mechanical behavior of metals with the help of micromechanical modeling and simulations.
2014-2016	**Lecturer** in MMED, UET, Taxila Pakistan **Responsibilities:** Planning and development of departmental laboratories, monitoring the research progress of graduate students.
2012-2013	**Lecturer** (Visiting Faculty Member) in DMME, UET, Lahore Pakistan **Responsibilities:** Designed a manual for laboratory experiments related to physical metallurgy, industrial materials, fracture and deformation, mechanical metallurgy and conducted these laboratory demonstrations.
2010-2012	**Lab. Engineer** in FMSE, GIK Institute, Topi, Pakistan **Responsibilities:** Demonstration of laboratory experiments related to electric and magnetic materials**,** metallography, and microscopy of metals**,** working as a teaching

assistant for different undergraduate courses along with record management and certain other administrative assignments.

2009-2009 **Internee** in Millat Tractors Pvt. Ltd. & Qadri Brothers Pvt. Ltd. Lahore, Pakistan.
Training Included: Quality assurance in metallic components of MFG tractors, Usage of non-destructive testing, Casting design analysis, Casting process study.

Administrative Positions

2015-2016 Worked as
- Deputy Director Placement & Career Counseling
- Deputy Director International Linkages
- Assistant Coordinator PEB

2021-2022 Worked as
- Director Admissions

Teaching Courses

- Introduction to Engineering Materials
- Mechanics of Materials
- Mechanical Behaviour of Materials
- Computational Materials Engineering
- Computer Adid Design
- Crystal Plasticity
- Phase Field Modelling
- Documentation in Materials Science
- Phase Transformation in Materials
- Advanced Materials

List of Publications

1. **W. Amin**, A. Biswas, M. R. G. Prasad, N. Vajragupta, A. Hartmaier
   On the role of grain boundary texture in dynamic grain growth in FCC metals **(in process)**
2. M. R. G. Prasad, A. Biswas, **W. Amin**, S. Gao, N. Vajragupta, A. Hartmaier
   Influence of pore shape on anisotropic mechanical behavior of L-PBF manufactured metal by micromechanical modeling, Advanced Engineering Materials 22, 12, (2020)
3. M. A. Ali, I. Lopez-Galilea, **W. Amin**, S. Gao et al.
   Effect of γ' precipitate size on hardness and creep properties of Ni-base single crystal superalloys: experiment and simulation, Materialia, 12, 100692, (2020)
4. M. A. Ali, **W. Amin**, O. Shchyglo, I. Steinbach.
   45-degree rafting in Ni-based superalloys: A combined phase-field and strain gradient crystal plasticity study, International Journal of Plasticity, 128, 102659, (2020)
5. **W. Amin**, M. A. Ali, N. Vajragupta, A. Hartmaier.
   Studying grain boundary strengthening by dislocation-based strain gradient crystal plasticity coupled with a multi-phase-field model, Materials, MDPI, Basel, Switzerland, 12, 2977, (2019)
6. J. A. Qayyum, K. Altaf, A. Abdul-Rani, **W. Amin** et al.
   Metal injection molding process parameters as a function of filling performance of 3D printed polymer mold, MATEC Web of Conferences, Malaysia, 225, 6, (2018)
7. J. K. Engels, S. Gao, **W. Amin**, A. Biswas et al.
   Indentation size effects in spherical nanoindentation analyzed by experiment and non-local crystal plasticity, Materialia, 3, 21-30, (2018)
8. M. A. Hussain, A. Maqbool, F.A. Khalid, M. U. Farooq **W. Amin** et al.
   Improved sinterability of hydroxyapatite functionally graded materials strengthened with SS316L and CNTs fabricated by pressureless sintering, Ceramics International, 41, 10125-10132, (2015)

Talks and Posters

- 2nd International Conference on Advanced Materials and Emerging Technologies, UET Lahore, 1st Jul. 2021
  Micromechanical modeling of metals using Phase field coupled strain gradient crystal plasticity method.
  Waseem Amin

- The 2nd Young Materials Researcher's Day (MRD) Ruhr-Universität Bochum, 2nd Dec. 2019
  Creep and strengthening through interfaces explained by dislocation-based strain-gradient crystal plasticity-phase field method.
  Waseem Amin, Muhammad Adil Ali, Alexander Hartmaier, Ingo Steinbach
- The 4th International Symposium on Phase-Field Modelling in Materials Science Ruhr- Universität Bochum, Germany 22 - 25 Jul. 2019
  Micromechanical modeling of metals using strain gradient plasticity-phase field method.
  Waseem Amin, Muhammad Adil Ali, Oleg Shchyglo
- The 2nd Materials Chain International Conference, MCIC 2018 Session: Modelling and Simulation Ruhr-Universität Bochum 12-14 Nov. 2018
  Micromechanical modeling of metals using crystal plasticity-phase field method.
  Waseem Amin, Napat Vajragupta, Alexander Hartmaier
- 10 Years ICAMS - International Symposium, Ruhr-Universität Bochum, Germany
  25th Jun. 2018
  Prediction of large deformations in FCC Metals using crystal plasticity phase-field method.
  Waseem Amin, Napat Vajragupta, Alexander Hartmaier
- 27th International Workshop on Computational Mechanics of Materials (IWCMM27), Leuven, Belgium, 20th Sep. 2017
  Parameterization of a nonlocal crystal plasticity model by nanoindentation and inverse modeling.
  Jenni Kristin Engels, **Waseem Amin**, Abhishek Biswas, Siwen Gao, Daysi Karina Gonzalez Dacasa, Soheil Rooein, Napat Vajragupta, Alexander Hartmaier
- 2nd International Conference on Advanced Materials and Emerging Technologies (ICAMET), Lahore, Pakistan 1st Jul. 2021
  Phase-field coupled strain-gradient crystal plasticity method and its applications.
  Waseem Amin

Software Authored

I have contributed to an open-source software OpenPhase https://openphase.rub.de/authors.html by authoring code on strain-gradient crystal plasticity method. It can be used to performs Multiphysics analysis involving microstructural evolution.

Academic Training

Received one-month intensive training National Academy of Higher Education, HEC under NFDP-2021 in September 2021. It included following modules:

Effective Teaching	Course Design & Policies	Lesson Delivery	Research Genesis
Assessment	Launching Your Career	Research for Impact	Proposals Writing
Scholarship of Teaching and Learning		Scholarly Writing	Lesson Planning & Learning Activities

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Skill tools

Very good command on the following educational/experimental/scientific tools/software packages/ code libraries /editors

Teaching tools
- Microsoft teams
- Zoom conferencing
- Google classrooms and forms
- Kahoot
- Moodle
- Mentimeter
- Coggle
- Perusall

Experimental techniques
- Tensile testing
- Hardness testing
- Metallography
- Optical microscopy

Programming Languages
- C++
- Python
- Bash scripting
- Vim
- Nano

Simulation and analysis software
- OpenPhase
- Gnuplot
- MATLAB
- MTEX
- Paraview

Writing and editing
- Microsoft Office
- Latex
- Overleaf
- Mendeley

Solid part modeling
- Solid Edge

- Auto CAD

Videography

- VSDC
- Lightworks
- Filmora

Research Interests

- **Simulation methods**: Phase Field, Crystal Plasticity, Dislocation Dynamics
- **Structural materials**: Light metal alloys, superalloys, steels, metal matrix composites
- **Material Properties**: Mechanical, thermo-mechanical, thermo-chemo-mechanical

Professional Memberships

- Member of Pakistan Engineering Council (PEC)
- Member (ASTM, USA)
- ProfGradMIMMM (IOM3, UK)

Awards and Certificates

Research funding award for

- MSc degree from Ghulam Ishaq Khan Institute (GIKI) Topi, Pakistan (2010-2012)
- PhD research from Higher Education Commission (HEC) of Pakistan (2016-2020)

Certificates

- Certificate of participation in month intensive training on modern practices for teaching, research and professional development in academia by National Academy of Higher Education, Pakistan, 1-31 Aug. 2021.
- Certified peer reviewer by Elsevier Researcher Academy.
- Two-days symposium on “Synthesis and Characterization of Functional Materials”, 26-27 May (2015) Islamabad, Pakistan.
- Three-days short course on Fracture analysis at Failure analysis center (FAC), 12-14 Oct. (2015) at Institute of Space Technology, Islamabad.
- One-day seminar (a CPD activity) on "Shape Memory Alloys: Casting and Properties", 23 Feb. 2015 at UET Taxila Pakistan.
- One-day seminar (a CPD activity) on "Assessment of Material Damage during Sheet Metal Deformation and Failure Process", 12 Jun. 2015 at UET Taxila Pakistan.
- One-day seminar (a CPD activity) on "Functional near-infrared spectroscopy-based brain-computer interfaces and its applications", 02 Dec. 2015 at UET Taxila Pakistan.
- Organized a four-days national level event (a CPD activity) titled "National Workshop on Novel Approach to First Course in Circuits", 11-14 Jan. 2016 at UET Taxila Pakistan.
- Attended “Faculty development for entrepreneurship and improvement of industry-academia linkage” by Pakistan Institute of Entrepreneurship, 9 Feb. 2016, Islamabad, Pakistan.
- Organized several workshops on US Fullbright Scholarships for UG/PG students at UET Taxila Pakistan.
- Participation in conferences on "High Performance Computing in Materials Science", 22-24 Feb. 2017, and on "Data Driven Materials Science, 23-25 May 2018, Soest, Germany.
- Participation in an interdisciplinary conference on "Our environment, our future: impulse through technical innovation", 31 Mar.-2 Apr. 2017, Kassel, Germany.
- Participation in the international symposium on 10 years of ICAMS, 25-27 Jun. 2018, Bochum, Germany.
- Participation in an annual event “RUB Research Day: Requirements and attitudes for a successful research career”, 28 Feb. 2019, Bochum, Germany.

Voluntary Work

Worked as peer reviewer for the following Journals.

- International Journal of Plasticity (Elsevier)
- Materials (MDPI)
- Coatings (MDPI)
- Crystals (MDPI)