

Ovais Khan

Assistant Professor
Department of Aerospace Science Engineering
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Research Interests

- Implementation of high-resolution numerical schemes and advanced time stepping algorithms for modeling shock/boundary layer interaction phenomena.
- High-fidelity computational analysis of fluid dynamic problems from low-speed to high-speed flow regimes and renewable energy resources.
- Computational fluid dynamics (CFD), heat transfer analysis and finite element analysis (FEA).

Educational Record:

- **Wichita State University**
Ph.D., Aerospace Engineering, Wichita, KS, USA
- **King Fahd University of Petroleum & Minerals**
M.S., Mechanical Engineering, Dhahran, Saudi Arabia
- **NED University of Engineering & Technology**
B.S., Mechanical Engineering, Karachi, Pakistan

Professional Experience:

- **Tuskegee University, Tuskegee, AL**
Assistant Professor - Dept. of Aerospace Sci. Engineering
 - Three-dimensional (3D) numerical modeling of tip-gap clearance flows.
 - Teaching and research activities related to Aerodynamics, CFD and Engineering Design.
- **University of Kentucky, Lexington, KY**
Postdoctoral Scholar - Dept. of Mechanical Engineering
 - Development of multi-dimensional charring ablator material response code for modeling re-entry vehicles.
 - Multi-dimensional CFD code for modeling heat transfer phenomena using finite volume approach.
- **Wichita State University, Wichita, KS**
Postdoctoral Fellow - Dept. of Aerospace Engineering
 - Modeling of 2D and 3D aero-acoustic flow over doors/windows of a business jet (Cessna Aircraft Company) using CFD code FLUENT.
 - Development of DNS code based on high-order shock-capturing scheme WENO for modeling shock-turbulence interaction phenomena.
- **Wichita State University, Wichita, KS**
GRA - Dept. of Aerospace Engineering
 - CFD modeling of aerodynamic and magneto-aerodynamic high-speed flows.
 - Surface pressure distribution analysis for NACA-0015 airfoil using panel methods.
 - Coupled aero-structural analysis using FEA code ANSYS and FORTRAN.
 - Performed parallelization of CFD codes for heat transfer analysis using MPI and MPICH2 environments.
- **King Fahd University of Petroleum & Minerals, Dhahran, KSA**
Dept. of Mechanical Engineering
 - Thermal analysis of cold rolling process using CFD commercial software FLUENT.
 - Investigation of nonlinear material behavior under laser pulse heating using FEA.
 - Finite element modeling of bulk deformation problems using commercial software ANSYS.

Honors and Awards:

1. **Postdoctoral Research Scholar, University of Kentucky, KY, USA**
 - o Mechanical Engineering Department, January 2011 to July 2012.
2. **Visiting Foreign Professor – Higher Education Commission, Pakistan**
 - o PNS-Jauhar, Mechanical Engineering Department, Spring 2012.
3. **Postdoctoral Research Fellowship, National University of Singapore (NUS), Singapore**
 - o Received an offer to join the Mechanical Engineering Department in January 2011 (didn't avail).
4. **Ollie A. & J. O. Heskett Graduate Fellowship, 2009**
5. **Research Fellowship, 2003–2008:** Dept. of Aerospace Engineering, Wichita State University.
6. **International Student Scholarship, 2006–2007:** For providing leadership and services to WSU.
7. **Dora Wallace Hodgson Outstanding Doctoral-level Student Award, 2005–2006.**
8. **Research Fellowship, 1999–2003:** Dept. of Mechanical Engineering, King Fahd University of Petroleum & Minerals.

Professional Memberships/Activities:

- Journal Referee: AIAA Journal, AIAA Journal of Spacecraft and Rockets, IEEE Transactions on Magnetics, *IMechE* Journal of Mechanical Engineering Sciences.
- Sigma Gamma Tau – National Honorary Society of Aerospace Engineering.
- American Institute of Aeronautics and Astronautics, AIAA.

Selected Publications:

Refereed Journal Articles

- 1) **Ovais U. Khan** and Klaus A. Hoffmann, “Unsteady Supersonic Flows over a Backward-Facing Step with Applied Magnetic Field”, *AIAA Journal of Spacecraft and Rockets*, Vol. 47, No. 2, pp. 405-412, May-June, 2010.
- 2) **Ovais U. Khan** and Klaus A. Hoffmann, “Numerical Investigation of Decomposed Magnetofluidynamics Equations”, *AIAA Journal*, Vol. 47, No. 11, pp. 2666-2675, November, 2009.
- 3) **Ovais U. Khan** and Klaus A. Hoffmann, “Flow Control over a Backward-Facing Step with the Application of a Magnetic Field”, *AIAA Journal of Spacecraft and Rockets*, Vol. 45, No. 2, pp. 255-263, March-April, 2008.
- 4) **Ovais U. Khan**, Klaus A. Hoffmann and Jean-François Dietiker, “Computational Aspects of High-Speed Flows With Applied Magnetic Field”, *IEEE Transactions on Magnetics*, Vol. 42, No. 3, pp. 389-397, March, 2006.
- 5) B.S. Yilbas, **Ovais U. Khan**, I.Z. Naqavi, “Laser Pulse Heating and Thermal Stress Developments: Elasto-plastic Analysis”, *Proceedings of the IMechE Part B Journal of Engineering Manufacture*, Vol. 218, No. 4, pp.375-388, 2004.
- 6) **Ovais U. Khan**, A. Jamal, G.M. Arshed, S.M. Zubair, “Thermal Analysis of Cold Rolling Process – A Numerical Approach”, *Numerical Heat Transfer; Part A: Applications*, Vol. 46, No. 6, pp. 613-632, Oct 1, 2004.

Refereed Conference Papers

- 1) **Ovais U. Khan** and Alexandre Martin, “Effect of Applied Magnetic Field on Shock Boundary Layer Interaction”, AIAA 2012-0355 – 50th AIAA ASM, Nashville, TN, January, 2012.
- 2) Alexandre Martin, **Ovais U. Khan**, and H. B. Zhang, “Numerical Investigation of Three-Dimensional Effects within a Charring Ablator”, 5th Ablation Workshop, Feb 28 – March 1, 2012, Lexington, KY.
- 3) **Ovais U. Khan** and Alexandre Martin, “Three-Dimensional Modeling of Ablation by Control Volume Approach”, 36th AIAA Annual DCASS, Miamisburg, OH, March, 2011.
- 4) **Ovais U. Khan** and Klaus A. Hoffmann, “Computational Aspects of Various Magneto-Fluid-Dynamic Formulations”, AIAA 2009-3912 – 40th AIAA PDL Conf., San Antonio, TX, June, 2009.
- 5) **Ovais U. Khan** and Klaus A. Hoffmann, “Numerical Investigation of Decomposed Full Magneto-Fluid-Dynamics Equations”, AIAA 2008-1068 – 46th AIAA ASM, Reno, NV, January, 2008.
- 6) **Ovais U. Khan**, Klaus A. Hoffmann and J. F. Dietiker, “Validity of Low Magnetic Reynolds Number Formulation of Magnetofluiddynamic”, AIAA 2007-4374 – 38th AIAA PDL Conf., Miami, FL, June, 2007.