

# Mostafa Aghaei Jouybari, Ph.D.

Assistant Professor, University of Kansas

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🔗 [Google Scholar](#)

🏠 [CTLab](#)

## PROFESSIONAL SUMMARY

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- A dedicated Assistant Professor committed to advancing Aerospace Engineering and Compressible Aerodynamics.
- Highly experienced Computational Fluid Dynamicist. Proficient in various aspects of Turbulence Simulation & Modeling (DNS/LES/RANS), Supersonic Flows, Numerical Methods, Artificial Intelligence, High Performance Computing (HPC), and Immersed Boundary Methods.
- Proven track record of successful research. Possesses exceptional problem-solving abilities, a collaborative mindset, and adeptness in communicating complex academic and technical concepts effectively.
- A committed instructor with a strong focus on fostering a deep understanding of Aerodynamics among students, backed by extensive teaching experience.

## APPOINTMENTS

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**Assistant Professor,** *July 2024 - Present*  
Director of Computational Turbulence Laboratory (CTLab),  
Department of Aerospace Engineering,  
University of Kansas, KS, USA.

**ORISE Postdoctoral Fellow,** *March 2024 - July 2024*  
Division of Quantitative Method and Modeling, CDER, OGD  
US Food & Drug Administration (FDA), MD, USA.

**Postdoctoral Fellow, Mechanical Engineering,** *March 2021 - March 2024*  
Johns Hopkins University, MD, USA.

## EDUCATION

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**Ph.D. Mechanical Engineering,** *Dec 2020*  
Michigan State University, MI, USA.

- Thesis: *Simulation and modeling of compressible and incompressible turbulent channel flows over rough walls* ([link to abstract](#)).

**B.Sc. Mechanical Engineering,** *Jul 2016*  
Sharif University of Technology, Tehran, Iran.

**B.Sc. Aerospace Engineering,** *Jul 2016*  
Sharif University of Technology, Tehran, Iran.

## GRANTS

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PI: <i>Aerothermal Assessment of Hypersonic Flows over Ablated Surfaces and Woven TPS.</i>	\$1,125,000	<i>Oct 2025 – Oct 2028</i>
Kansas NASA EPSCoR Program (KNEP). Cooperative Agreement No. 80NSSC25M0011.		

## MENTORING

Postdoctoral Fellow	Diba Behnoudfar	Dec 2025 – Present
Ph.D. Student	Adrian Cabildo	Sep 2025 – Present
Ph.D. Student	Nikhil Kohar	Sep 2025 – Present
Ph.D. Student	Rupashree Dutta	Jan 2026 – Present
Undergrad RA	Jacob Hansen	Feb 2025 – Present
Undergrad RA	Declan Kurtz	Feb 2025 – Present
Undergrad RA	Kaylee Patterson	Aug 2025 – Present
Undergrad RA	Lizzie Scharpf	Aug 2025 – Present

## TEACHING

- AE 445: Aircraft Aerodynamics and Performance Spring 2025, 2026
- AE 744: Turbulent Flows Fall 2025
- AE 700: Special Topics: Wall-bounded Turbulent Flows Spring 2025
- Teaching Assistant and Guest Lecturer, Advanced Turbulence, Johns Hopkins University. Fall 2021
- CFD Lab Coordinator, Michigan State University. 2019 – 2021
- Teaching Assistant, Fluid Mechanics Lab, Michigan State University. Spring 2017
- Teaching Assistant, Thermodynamics I, Sharif University. Spring 2014

### Student Testimonials:

- (AE 744 Turbulent Flow, Fall 2025) “Dr. Jouybari’s method of encouraging active participation from the students allowed for the attempt of applying what has been learned to the problems that are actively being solved, turning the students from passive observers in the derivation of the fundamental equations into active participants”.
- (AE 700 Special Topics: Wall-bounded Turbulent Flows, Spring 2025) “This class was exceptional. The slideshows were easy to look at with great information. The professor did an excellent job at presenting the information and answering questions”.

## JOURNAL ARTICLES

1. **M. Aghaei Jouybari**, J.H. Seo, S. Pinto, L. Cattafesta, C. Meneveau and R. Mittal (2024). Extended Darcy–Forchheimer law including inertial flow deflection effects. *Journal of Fluid Mechanics*, **980**, A13. <https://doi.org/10.1017/jfm.2023.1083>
2. **M. Aghaei Jouybari**, J. Yuan, Z. Li, G.J. Brereton and F.A. Jaber (2023). Supersonic turbulent flows over sinusoidal rough walls. *Journal of Fluid Mechanics*, **956**, A3. <https://doi.org/10.1017/jfm.2022.1049>
3. **M. Aghaei Jouybari**, J.H. Seo, J. Yuan, R. Mittal and C. Meneveau (2022). Contributions to pressure drag in rough-wall turbulent flows: Insights from force partitioning. *Physical Review Fluids*, **7**, 084602. <https://doi.org/10.1103/PhysRevFluids.7.084602>
4. **M. Aghaei Jouybari**, J. Yuan, G.J. Brereton and M.S. Murillo (2021). Data-driven prediction of the equivalent sand-grain height in rough-wall turbulent flows. *Journal of Fluid Mechanics*, **912**, A8.

<https://doi.org/10.1017/jfm.2020.1085>

5. G.J. Brereton, **M. Aghaei Jouybari** and J. Yuan (2021). Toward modeling of turbulent flow over surfaces of arbitrary roughness. *Physics of Fluids*, **33**, 065121.  
<https://doi.org/10.1063/5.0051097>
6. **M. Aghaei Jouybari**, G.J. Brereton and J. Yuan (2019). Turbulence structures over realistic and synthetic wall roughness in open channel flow at  $Re_\tau = 1000$ . *Journal of Turbulence*, **20**, 723-749.  
<https://doi.org/10.1080/14685248.2019.1706741>
7. J. Yuan and **M. Aghaei Jouybari** (2018). Topographical effects of roughness on turbulence statistics in roughness sublayer. *Physical Review Fluids*, **3**, 114603.  
<https://doi.org/10.1103/PhysRevFluids.3.114603>

## REFEREED CONFERENCE PROCEEDINGS

1. S.N. Pinto, Y. Zhang, L.N. Cattafesta, R. Mittal, C. Meneveau, M. Luhar, **M. Aghaei Jouybari**, J.H. Seo, S. Vijay and I. Eizenberg (2023). Characterization of Periodic Lattice Anisotropic Porous Materials for Passive Flow Control. *AIAA AVIATION 2023 Forum*, AIAA 2023-3448.c1.  
<https://doi.org/10.2514/6.2023-3448.c1>
2. G.J. Brereton, J. Yuan, and **M. Aghaei Jouybari**. Surface body-force model for turbulent flow over rough walls. In Proc. 34<sup>th</sup> Symposium on Naval Hydrodynamics, Washington D.C., USA, 2022.
3. **M. Aghaei Jouybari**, J. Yuan, and G. J. Brereton. DNS data driven modeling of turbulent flows over rough walls. In Proc. 33<sup>rd</sup> Symposium on Naval Hydrodynamics, Osaka, Japan, 2020.

## CONFERENCE PRESENTATIONS

1. **M. Aghaei Jouybari**, J.H. Seo, S. Pinto, L. Cattafesta, C. Meneveau and R. Mittal. Generalized Darcy-Forchheimer law for capturing flow refraction effects in anisotropic porous media. Presented at the 76<sup>th</sup> annual meeting of APS-DFD, Washington D.C., Nov 19–21, 2023.
2. **M. Aghaei Jouybari**, J.H. Seo, S. Pinto, L. Cattafesta, C. Meneveau and R. Mittal. Darcy-Forchheimer law for porous media flows in the highly-nonlinear regime for passive flow control. Presented at the 75<sup>th</sup> annual meeting of APS-DFD, Indianapolis, IN, Nov 20–22, 2022.
3. J.H. Seo, **M. Aghaei Jouybari**, S. Pinto, C. Meneveau, L. Cattafesta and R. Mittal. Control of wall-mounted bluff body wake by a porous substrate. Presented at the 75<sup>th</sup> annual meeting of APS-DFD, Indianapolis, IN, Nov 20–22, 2022.
4. **M. Aghaei Jouybari**, J.H. Seo, J. Yuan, R. Mittal, and C. Meneveau. How are flow structures related to drag forces and equivalent sandgrain height in turbulent flows over rough walls? Presented at the 74<sup>th</sup> annual meeting of APS-DFD, Phoenix, AZ, Nov 21–23, 2021.
5. **M. Aghaei Jouybari**, J. Yuan, F.A. Jaber and G.J. Brereton. Turbulence behavior in supersonic channel flows with two- and three-dimensional sinusoidal roughness. Presented at the 73<sup>rd</sup> annual meeting of APS-DFD, Chicago, IL, Nov 22–24, 2020.
6. **M. Aghaei Jouybari**, G.J. Brereton and J. Yuan. Multi-parameter prediction of roughness function and drag profiles in turbulent channel flows over rough walls. Presented at the 72<sup>nd</sup> annual meeting of APS-DFD, Seattle, WA, Nov 23–26, 2019.
7. G.J. Brereton, J. Yuan and **M. Aghaei Jouybari**. Modeling turbulent rough-wall flow with pseudo body forces. Presented at the 72<sup>nd</sup> annual meeting of APS-DFD, Seattle, WA, Nov 23–26, 2019.

8. **M. Aghaei Jouybari**, J. Yuan and G.J. Brereton. Effects of irregular roughness on roughness-sublayer turbulence statistics and coherent motions. Presented at the 71<sup>st</sup> annual meeting of APS-DFD, Atlanta, GA, Nov 18–20, 2018.
9. **M. Aghaei Jouybari** and J. Yuan. Roughness topographical effects on mean momentum and stress budgets in developed turbulent channel flows. Presented at the 70<sup>th</sup> annual meeting of APS-DFD, Denver, CO, Nov 19–21, 2017.

## SERVICE

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- Reviewer: NSF Proposal Review Panel *Dec 2025*
- Instructor: KU School of Engineering Summer Camp for K–12 Students *Jul 2025*

## SKILLS

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- Computational Fluid Dynamics — ViCar3D, LJCompressible, ANSYS-Fluent, OpenFOAM
- Turbulence Simulation & Modeling — DNS, LES, RANS
- Programming Languages — MATLAB, Python, Fortran, C++
- Machine Learning, AI — Supervised, Unsupervised, Reinforcement Learning
- High Performance Computing — OpenMP, MPI, GPU, SLURM, Bash
- Topology Optimization — Genetic Algorithms