

PROMOTION RECOMMENDATION  
The University of Michigan  
College of Engineering  
Department of Aerospace Engineering

Krzysztof J. Fidkowski, associate professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering, is recommended for promotion to professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering.

Academic Degrees:

Ph.D. 2007 Massachusetts Institute of Technology, Aerospace Engineering, Cambridge, MA  
M.S. 2004 Massachusetts Institute of Technology, Aerospace Engineering, Cambridge, MA  
B.S. 2003 Massachusetts Institute of Technology, Physics, Cambridge, MA  
B.S. 2003 Massachusetts Institute of Technology, Aerospace Engineering, Cambridge, MA

Professional Record:

2014 – present Associate Professor (with tenure), Department of Aerospace Engineering,  
University of Michigan  
2008 – 2014 Assistant Professor, Department of Aerospace Engineering, University of  
Michigan  
2003 – 2004 Post-Doctoral Associate, Department of Aeronautics and Astronautics,  
Massachusetts Institute of Technology, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Fidkowski has a truly exceptional classroom teaching record. His teaching evaluations and student letters are uniformly outstanding. He is seen as a leader in pedagogy in the college, and his teaching statement points to his innovation, attention to detail, and accessibility to the students. He has established himself as exceptionally talented, dedicated and effective. It also bears mentioning that he frequently teaches two or more courses per semester, voluntarily teaching more than required by the department. Professor Fidkowski has a solid record of mentoring graduate students and post-doctoral scholars, and is in high demand as a doctoral committee member for other faculty members' students.

Research: Professor Fidkowski has published over 35 journal articles, most of which are in top-tier journals such as the *Journal of Computational Physics* and the *AIAA Journal*. He also has over 50 refereed conference or symposium papers. A software package that he, his post-doctoral scientists, and his students have developed is registered with UM's Technology Transfer Office and is being disseminated under an open-source license. He has attracted funding from a number of sources with his share of research funding in his time here over \$3.4M. His funding currently supports one doctoral student whose committee he chairs, five whose committees he co-chairs, and one post-doctoral scientist; over the course of his career he has graduated nine Ph.D.'s (eight as chair and one as co-chair) and mentored a number of post-doctoral scientists, and advised M.S. and undergraduate students.

### Recent and Significant Publications:

- Z.J. Wang, Krzysztof J. Fidkowski, Remi Abgrall, Francesco Bassi, Doru Caraeni, Andrew Cary, Herman Deconinck, Ralf Hartmann, Koen Hillewaert, H.T. Huynh, Norbert Kroll, Georg May, Per-Olof Persson, Bram van Leer, and Miguel Visbal, “High-order CFD methods: Current status and perspective,” *International Journal for Numerical Methods in Fluids*, 2013; 72(8):811-845.
- Krzysztof J. Fidkowski, Todd A. Oliver, James Lu, and David L. Darmofal, “p-Multigrid solution of high-order discontinuous Galerkin discretizations of the compressible Navier-Stokes equations,” *Journal of Computational Physics*, 2005; 207: 92-113.
- Krzysztof J. Fidkowski and David L. Darmofal, “Review of output-based error estimation and mesh adaptation in computational fluid dynamics,” *AIAA Journal*, 2011; 49(4): 673-694.
- Guodong Chen and Krzysztof J. Fidkowski, “Discretization error control for constrained aerodynamic shape optimization,” *Journal of Computational Physics*, 2019; 387: 163-185.
- Krzysztof J. Fidkowski, “Output-based space-time mesh optimization for unsteady flows using continuous-in-time adjoints,” *Journal of Computational Physics*, 2017; 341(15): 258-277.

Service: Professor Fidkowski is a sought-after member of committees at the departmental, college and professional levels. From his outstanding work as the graduate program chair, to his membership on the advisory boards of ADVANCE and CRLT, his contributions to the department, college, and university have been strong. He organized EMERGE, focusing on recruiting URM and female students, and he coordinated a visit by faculty from minority-serving institutions to discuss partnerships in teaching, research, and recruiting. He has also worked with his department’s DEI committee and has contributed to NextProf. His external service, including his service to AIAA and his work as an associate editor of the *International Journal of Numerical Methods in Fluids*, is a sign of his engagement in his research community.

### External Reviewers:

Reviewer A: “He is well known for his works on output-based error estimates, mesh adaptation, and high-order finite element discretizations, all of which are rooted in rigorous mathematical analysis. He genuinely cares about advancing the state of the art of CFD to a level where it satisfies the demands of practitioners for not only accuracy, but also robustness and computational efficiency.”

Reviewer B: “Through his published work on meshing and adaptive mesh refinement, adjoint-based error estimation, high order accurate discretization, and optimal scalable solvers, he has done more than anyone I can think of to bring these advanced mathematical/computational/geometric concepts to CFD flows of interest in practical aerospace engineering problems.”

Reviewer C: “On research, I found Dr. Fidkowski’s work to be solid, thoughtful, relevant, and of the highest quality.”

Reviewer D: “He has a rare talent in that he not only can generate new ideas, but also implement them efficiently and robustly in computer software packages to solve real world problems. I would rank him in the top three among his generation of CFD researchers in the world.”

Reviewer E: “His work is characterized by a high degree of rigor, as well as being high in novelty and significance... I would place Dr. Fidkowski among the top in the world on adjoint methods based on his contributions and the depth of his understanding.”

Summary of Recommendation: Professor Fidkowski shows impressive balance as a faculty member. He has excelled in research, teaching, and service. He is recognized by his colleagues at Michigan and beyond, and his students, as an outstanding member of the faculty of the Department of Aerospace Engineering. It is with the support of the College of Engineering Executive Committee that I recommend Krzysztof J. Fidkowski for promotion to professor of aerospace engineering, with tenure, Department of Aerospace Engineering, College of Engineering.



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Alec D. Gallimore, Ph.D.  
Robert J. Vlasic Dean of Engineering  
College of Engineering

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