

Sunil Arolla

Assistant Professor, IIT Palakkad
Mechanical Engineering
Room No. 110, IIT Palakkad
Palakkad, Kerala, India - 678557.

skarolla@iitpkd.ac.in
<https://sites.google.com/site/arollasunil>
Skype: [sunil.arolla](https://www.skype.com/people/sunil.arolla)
Phone: +91 (701) 390-5157

Education **Iowa State University, Ames, USA**
Ph.D., Aerospace Engineering, 2013.
Fields: Turbulence modeling, Computational Fluid Dynamics.

IIT Guwahati, India
M.Tech., Mechanical Engineering, 2006.
Fields: Fluid-Thermal Sciences.

Intell Engineering College, Affiliated to JNTU, India
B.Tech., Mechanical Engineering, 2004.

Dissertation “Modeling and simulation of rotating and curved turbulent flows”:
Developed a correction for the turbulence models used in CFD that unifies
the effects of rotation and curvature; validated the model over a wide range
of engineering problems.

Advisor: Professor Paul A. Durbin

Experience **GE Aviation, Bangalore, India (2006-2008)**
Turbomachinery design engineer

RWTH Aachen University, Germany (Sep 2005 - June 2006)
DAAD research fellow

Iowa State University, Ames, USA (2008-2013)
Graduate research assistant

Sibley School of MAE, Cornell University, (2013-2015)
Postdoctoral associate

GALCIT, Caltech, (July 2015 - March 2016)
Postdoctoral scholar

MJR College, Affiliated to JNTU, (July 2016 - September 2016)
Assistant professor, Mechanical Engineering

Altair Engineering, Bangalore, India, (October 2016 - Feb 2017)
Senior Software Engineer – CFD Development

IIT Palakkad, Palakkad, India, (July 2017 - present)
Assistant Professor, Mechanical Engineering

Teaching

IIT Palakkad, Palakkad, India

Course instructor, Introduction to Computational Fluid Dynamics, Fall 2017

Course instructor, Applied Fluid-Thermal Engineering, Winter 2018

Course instructor, Finite Element Analysis, A module on error analysis, Winter 2018

Lab coordinator, Mechanical Engineering Lab - 2, Winter 2018

MJR College, JNTU, Chittoor, India

Course instructor, Heat transfer, 2 months of Fall 2016

Lab coordinator, Heat transfer lab, 2 months of Fall 2016

Awards and Fellowships

Research excellence award, Iowa State University, Fall 2012

For developing and testing rotation/curvature corrections for the turbulence models.

Six-Sigma Green Belt, GE Aviation, 2007

For developing and implementing loss models for the compressor preliminary design.

DAAD fellowship, 2005-2006

Simulation of subsonic coaxial jets as part of the noise-reduction project.

Publications

Sunil K. Arolla, Olivier Desjardins, "Transport modeling of sedimenting particles in a turbulent pipe flow using Euler-Lagrange large eddy simulation", International Journal of Multiphase Flow, Vol. 75, 2015, 1-11.

Sunil K. Arolla, "Inflow turbulence generation for eddy-resolving simulations of turbomachinery flows", ASME J. Fluids Engg, Vol. 138, 2015, 031201-11.

Sunil K. Arolla, Paul A. Durbin, "LES of spatially developing turbulent boundary layer over a concave surface", Journal of Turbulence, Vol. 16, 2014, 81-99.

Xuan Ge, Sunil K. Arolla and Paul A. Durbin, "A bypass transition model based on intermittency function", Flow, turbulence and combustion, Vol. 93, 2014, 37-61.

Sunil K. Arolla, Paul A. Durbin, "A rotation/curvature correction for turbulence models for applied CFD", Progress in CFD, Vol. 14, No. 6, 2014, 341-351.

Sunil K. Arolla, Paul A. Durbin, "Modeling rotation and curvature effects within scalar eddy viscosity framework", International J. Heat Fluid Flow, Vol. 39, 2013, 78-89.

Conferences

Sunil K. Arolla, Paul A. Durbin, "Generating inflow turbulence for eddy simulation of turbomachinery flows", AIAA 2014-0593.

Sunil K. Arolla, Paul A. Durbin, "Assessing the effects of streamline curvature on the aerodynamic characteristics of circulation control airfoil", AIAA 2013-0958.

Sunil K. Arolla, Paul A. Durbin, "Incorporating rotation and curvature effects within scalar eddy viscosity closures", AIAA 2012-3283.

Sunil K. Arolla, Giridhar J., Trevor H. W., Andrew B., “Reduced order modeling of choked blade rows in axial flow compressors”, Proceedings of International Conference on Aerospace Science and Technology, Bangalore, June 2008.

Presentations Sunil K. Arolla, O. Desjardins, ”Sediment transport modeling using highly resolved Euler-Lagrange LES”, 67th Annual Meeting of the APS Division of Fluid Dynamics, November 2014, San Francisco, CA.

Sunil K. Arolla, J. Capecelatro, O. Desjardins, ”Numerical prediction of critical deposition velocity for turbulent liquid-solid slurry flow through a horizontal pipe”, AIChE Annual Meeting, November 2014, Atlanta, GA.

J. Capecelatro, Sunil K. Arolla, O. Desjardins, ”Eulerian-Lagrangian large eddy simulations of liquid-solid slurries”, 17th U.S. National Congress on Theoretical Applied Mechanics, June 2014, East Lansing, MI.

Sunil K. Arolla, J. Capecelatro, and O. Desjardins, ”Eulerian-Lagrangian large eddy simulations of dense liquid-solid slurry flow through a horizontal pipe”, 66 th Annual Meeting of the APS Division of Fluid Dynamics, November 2013, Pittsburgh, PA.

Sunil K. Arolla, P. Durbin, ”LES of spatially developing turbulent boundary layer over a concave surface”, 66 th Annual Meeting of the APS Division of Fluid Dynamics, November 2013, Pittsburgh, PA.

Sunil K. Arolla, P. Durbin, ”Effects of streamline curvature on separation prediction”, 62 nd Annual Meeting of the APS Division of Fluid Dynamics, November 2009, Minneapolis, MN.

Sunil K. Arolla, P. Durbin, ”RANS simulation of circulation control airfoil”, NASA Annual Review Meeting, January 2009, Orlando, FL.

Grants “Bluff body diagnostic cases in fluid dynamics”, VAJRA proposal submitted to DST for possible collaboration with Prof. Narayanan Komerath, Georgia Tech., USA.

“Extracting detailed statistics from Euler-Lagrange simulations of liquid-solid pipe flow”, (sole PI: Sunil K. Arolla), 719K CPU hours on Stampede.

“High-fidelity Euler-Lagrange simulations of turbulent fluid flows with sedimenting particles”, (PI: Sunil K. Arolla, Co-PI: O. Desjardins), 819K CPU hours on Stampede.

Services Member of software purchase committee, IIT Palakkad.

Member of coordination committee for student induction program at IIT Palakkad.

Accepted to serve on doctoral dissertation committee for multiple students.