Matthew Bronson de Stadler

Royal Institute of Technology (KTH)
Department of Mechanics
SE-100 44 Stockholm, Sweden

Phone: +46 8 790 7177
E-mail: matds@kth.se
Web: www.mech.kth.se/~matds

Education

Ph.D. Engineering Sciences (Mechanical Engineering), University of California San Diego. 2013
Thesis title: High resolution simulation of the turbulent wake behind a sphere in a stratified fluid
Advisor: Sutanu Sarkar.

M.S. Engineering Sciences (Mechanical Engineering), University of California San Diego. 2009

B.S. Aerospace Engineering, University of Virginia. With highest distinction. 2007
Minor: Applied Mathematics.

Awards and Honors

FLOW Postdoctoral Scholarship, KTH 2013-2014

Gordon Scholar, UCSD 2010-2013

Wally Schirra Memorial Scholarship, Achievement Rewards for College Scientists Foundation 2010-2013

National Defense Science & Engineering Graduate Fellowship, Department of Defense (HPCMO) 2008-2011

Jacobs School Fellowship, UCSD 2007-2010

Sigma Gamma Tau Outstanding Aerospace Engineering Graduate, UVA 2007

Virginia Space Grant Consortium Undergraduate Aerospace Research Scholarship 2006-2007

Harold S. Morton Jr. Memorial Scholarship, UVA 2006

Experience

Kungliga Tekniska Högskolan (Royal Institute of Technology), Stockholm, Sweden 2013-present
Postdoctoral Researcher, Mechanics Department, Professor Dan Henningson
Worked on development of a virtual wind tunnel for high resolution simulation of the flow around a wing at high Reynolds number

University of California San Diego, La Jolla, CA 2007-2013
Graduate Student Researcher, MAE Department, Professor Sutanu Sarkar
Developed numerical software and performed numerical simulations to study the turbulent wake behind a bluff body in a stratified fluid

Lawrence Livermore National Laboratory, Livermore, CA Summer 2007
Science and Engineering Technical Scholar, Institute for Scientific Computing Research
Developed a numerical simulation using Onsager's pancake approximation for fluid flow in a gas centrifuge

University of Virginia, Charlottesville, VA 2005-2007
Undergraduate Student Researcher, MAE Department, Professor Hossein Haj-Hariri
Investigated optimal geometries for a heat sink

Naval Research Laboratory, Washington, DC
Engineering Technician, Astrodynamics and Navigation Section,
Performed system integration support for a test of a new communications frequency Summer 2006
Modeled the communications link between a satellite and a ground network Summer 2005

Journal Articles

4. **Large Eddy Simulation of the near to intermediate wake of a heated sphere at Re = 10,000**
M. B. de Stadler, N.R. Rapaka and S. Sarkar, *Int. J. Heat Fluid Flow*, (in press).

3. **The spatial evolution of fluctuations in a self-propelled wake compared to a patch of turbulence**
A. Pal, M. B. de Stadler and S. Sarkar, *Phys. Fluids*, 25, 095106, 2013.

2. **Simulation of a propelled wake with moderate excess momentum in a stratified fluid**
M. B. de Stadler and S. Sarkar, *J. Fluid Mech.*, 692, 28-52, 2012.

1. **Effect of the Prandtl number on a stratified turbulent wake**
M. B. de Stadler, S. Sarkar and K. A. Brucker, *Phys. Fluids*, 22, 095102, 2010.

Conference Proceedings

3. **Large eddy simulation of the near wake of a heated sphere at** $Re = 10,000$
M. B. de Stadler and S. Sarkar, *Eighth International Symposium on Turbulence and Shear Flow Phenomena (TSFP8)*, Poitiers, France, 2013.

2. **Self-propelled wakes at different Froude numbers in a stratified fluid**
M. B. de Stadler and S. Sarkar, *Seventh International Symposium on Turbulence and Shear Flow Phenomena (TSFP7)*, Ottawa, Canada, 2011.

1. **Simulation of a self-propelled wake with moderate excess momentum in a homogeneous fluid**
M. B. de Stadler and S. Sarkar, *41st AIAA Fluid Dynamics Conference and Exhibit*, Honolulu, HI, 2011.

Conference Presentations

12. **Towards a Virtual Wind Tunnel - Fluid Simulations in the SeRC Exascale Flagship**
M. B. de Stadler, *Big Data and e-Science in Medical Science - 5th Annual Swedish e-Science Research Centre Meeting*, Stockholm, Sweden, 2014.

11. **Large eddy simulation of the near wake of a heated sphere at** $Re = 10,000$
M. B. de Stadler and S. Sarkar, *Eighth International Symposium on Turbulence and Shear Flow Phenomena (TSFP8)*, Poitiers, France, 2013.

10. **Buoyancy effects in stratified flow past a sphere at Re=3,700**
M. B. de Stadler and S. Sarkar, *65th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, San Diego, CA, 2012.

9. **A self-propelled wake as a patch of grid turbulence?**
M. B. de Stadler and S. Sarkar, *64th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Baltimore, MD, 2011.

8. **Self-propelled wakes at different Froude numbers in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *Seventh International Symposium on Turbulence and Shear Flow Phenomena (TSFP7)*, Ottawa, Canada, 2011.

7. **Simulation of a self-propelled wake with moderate excess momentum in a homogeneous fluid**
   M. B. de Stadler and S. Sarkar, *41st AIAA Fluid Dynamics Conference and Exhibit*, Honolulu, HI, 2011.

6. **Simulation of a self-propelled wake with small excess momentum in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *5th Southern California Symposium on Flow Physics*, Los Angeles, CA, 2011.

5. **Simulation of a self-propelled wake with small excess momentum in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *63rd Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Long Beach, CA, 2010.

4. **Simulation of a stratified self-propelled wake with excess momentum**
   M. B. de Stadler and S. Sarkar, *4th Southern California Symposium on Flow Physics*, Irvine, CA, 2010.

3. **The Effect of the Prandtl number on the turbulent stratified wake**
   M. B. de Stadler, S. Sarkar and K. A. Brucker, *62nd Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Minneapolis, MN, 2009.

2. **Optimization of the geometry of a heat sink**
   M. B. de Stadler, *ASME District F Student Conference*, Columbia, SC, 2007.

1. **Optimization of the geometry of a heat sink**
   M. B. de Stadler, *AIAA Region I-MA Student Conference*, Hampton, VA, 2007.

Seminars

4. **Spatially-evolving flow past a sphere in a stratified fluid at $Re = 10,000, Fr = 3$: body to intermediate wake**
   M. B. de Stadler, *Applied Physics Laboratory, University of Washington*, Seattle, WA, 2013.

3. **High resolution simulations of stratified turbulent wakes**
   M. B. de Stadler, *Department of Mechanics, Royal Institute of Technology (KTH)*, Stockholm, Sweden, 2013.

2. **High resolution simulation of the turbulent wake behind a sphere in a stratified fluid**
   M. B. de Stadler, *Jacobs Undergraduate Mentorship Program: Spring Large Group Meeting, UCSD*, La Jolla, CA, 2012.

1. **High resolution simulation of the turbulent wake behind a sphere in a stratified fluid**
   M. B. de Stadler, *Jacobs Innovators Forum: Modeling and Simulation, UCSD*, La Jolla, CA, 2012.

Posters

6. **A comparative study of a spatially evolving self-propelled wake and a patch of turbulence**
   A. Pal, M. B. de Stadler and S. Sarkar, *65th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, San Diego, CA, 2012.

   Also shown at: *UCSD Jacobs School of Engineering 32nd Annual Research Expo*, La Jolla, CA, 2013.

5. **Simulation of spatially evolving flow past a sphere in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *UCSD Jacobs School of Engineering 31st Annual Research Expo*, La Jolla, CA, 2012.

4. **Simulation of a self-propelled wake with excess momentum in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *Department of Defense High Performance Computing Modernization Program Users Group Conference 2011*, Portland, OR, 2011.

   Also shown at: *UCSD Jacobs School of Engineering 30th Annual Research Expo*, La Jolla, CA, 2011.

3. **Simulation of the wake of an accelerating body in a stratified fluid**
   M. B. de Stadler and S. Sarkar, *Department of Defense High Performance Computing Modernization Program Users Group Conference 2010*, Schaumburg, IL, 2010.

   Also shown at: *UCSD Jacobs School of Engineering 29th Annual Research Expo*, La Jolla, CA, 2010.

2. **Onsager's pancake approximation for fluid flow in a gas centrifuge**
   M. B. de Stadler, *Lawrence Livermore National Laboratory Summer Research Symposium*, Livermore, CA, 2007.

1. **Optimization of the geometry of a heat sink**
   M. B. de Stadler, *Virginia Space Grant Consortium Student Research Conference*, Williamsburg, VA, 2007.

Technical Reports

1. **A finite-difference numerical method for Onsager's pancake approximation for fluid flow in gas centrifuges**
   M. B. de Stadler and K. Chand, *UCRL-TR-236581*, Lawrence Livermore National Laboratory, 2007.

Theses

2. **High resolution simulation of the turbulent wake behind a sphere in a stratified fluid**
   M. B. de Stadler, *PhD Thesis*, UCSD, 2013.

1. **Optimization of the geometry of a heat sink**
   M. B. de Stadler, *Senior Thesis*, UVA, 2007.

Teaching Experience

Mentored new PhD student in my research group, UCSD. June 2011-2013

Teaching assistant, Flow and Transport in the Environment, UCSD. Fall 2011

Mentored undergraduate student in independent study course, UCSD. 2009-2010

Teaching assistant, Aerodynamics Laboratory course, UVA. Spring 2007

Service

Referee for Journal of Fluid Mechanics

Outreach

Jacobs Undergraduate Mentorship Program, Mentored a group of 1 senior level undergraduate and 4-6 freshman. 2011-2013

San Diego Science Festival, Spoke with K-12 students about life as a scientist/engineer. 2011-2013

Enspire, Led lab tours for middle school students. 2011, 2013

Envision, Led lab tours for high school girls interested in engineering and computer science. 2011-2013

Membership in Academic Societies

American Physical Society

Sigma Gamma Tau

Tau Beta Pi

Grants

PRACE preparatory access grant (1.1 million CPU hours) 2014