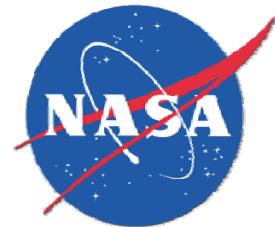


Agenda

Presentation of research accomplishments

13th Biennial Summer Program of the Center for Turbulence Research

Friday, July 23, 2010



2010 CTR Summer Program

Friday, July 23, 2010, Stanford University, Bldg. 200, Rm. 002

- 8:00AM Breakfast at the Citrus Courtyard (History Corner)
- 8:30AM Introduction: Prof. Parviz Moin**
- 9:00AM ACOUSTICS**
Overview and presentation: Prof. Daniel Bodony
- 9:10AM *Daniel Bodony*
- Understanding the role of temperature in turbulent jets
- Stephane Moreau, Julien Christophe, Curtis Hamman, Gianluca Iaccarino, Jeroen Witteveen*
- Uncertainty quantification for low-speed fan noise predictions based on RANS simulations
- 9:25AM Further discussion
- 9:30AM MULTI-PHASE FLOW**
Overview: Prof. Marcus Herrmann
Presentation: Prof. Olivier Desjardins and Prof. Marc Massot
- 9:40AM *Marcus Herrmann*
- Multi-scale modeling of interface dynamics for turbulent atomization applications
- Perrine Pepiot, Olivier Desjardins*
- Direct numerical simulation of dense particle-laden flows: investigation of drag forces acting on the particles
- Olivier Desjardins, Vincent Moureau, Marcus Herrmann*
- Methods for multi-phase flows with high-density ratio
- Xiangyu Hu, Nikolaus Adams*
- Multi-scale modeling of compressible multi-fluid flows with conservative interface method
- Laurent Selle, Jerome Dombard*
- On the mesoscopic Eulerian formalism for the simulation of dilute turbulent two-phase flows
- Lucie Freret, Olivier Thomine, Christophe Chalons, Rodney Fox, Matthieu Boileau, Julien Reveillon, Frederique Laurent, Stephane de Chaisemartin, Marc Massot*
- Eulerian models for turbulent combustion of polydisperse evaporating sprays: direct numerical simulation and new numerical strategy for LES

- 10:20AM Further discussion
- 10:30AM Coffee break (Citrus Courtyard)**
- 10:50AM BOUNDARY LAYERS**
Overview: Prof. Ron Adrian
Presentation: Prof. Jim Wallace and Dr. Johan Larsson
- 11:00AM *Ronald Adrian, Jon Baltzer, Xiaohua Wu*
- Turbulent Boundary Layer Structure: POD and Identification of Large Scale Motions and Vortex Packets
- Jonathan Watmuff, David Pook, Taraneh Sayadi, Xiaohua Wu*
- Fundamental physical processes associated with bypass transition
- Julio Soria, Callum Atkinson, Ivan Bermejo-Moreno, Sergei Chumakov, Xiaohua Wu*
- Topology, non-local geometry and dynamics of coherent structures in turbulent wall-bounded flows
- George Khujadze, Xiaohua Wu, Martin Oberlack, Marie Farge, Kai Schneider, Romain Nguyen van yen*
- Detection and analysis of coherent structures in turbulent boundary layer flow using wavelets
- Jim Wallace, George Park, Xiaohua Wu, Parviz Moin*
- Comparison of the flat-plate boundary layer turbulence statistics and structure in transitional and developed states
- Mihailo Jovanovic, Rashad Moarref, David Richter, Eric Shaqfeh*
- Model-based feedback control of turbulent flows and nonmodal amplification of disturbances in inertialess flows of viscoelastic fluids
- Jacob George, Alejandro De Simone, Gianluca Iaccarino*
- Modeling roughness effects in 2D and 3D rough-wall turbulent boundary layers by elliptic relaxation
- John O'Sullivan, Rene Pecnik, Gianluca Iaccarino*
- Investigating turbulence in wind flow over complex terrain
- Abdellah Hadjadj, Johan Larsson, Sanjiva Lele, Ali Mani*
- Large eddy simulation of shock/boundary layer interaction
- Sergio Pirozzoli, Matteo Bernardini, Johan Larsson, Joseph Nichols, Brandon Morgan, Abdellah Hadjadj, Sanjiva Lele*
- Analysis of unsteady effects in shock/boundary layer interactions
- 11:50AM Further discussion
- 12:00PM Lunch break at the Dohrmann Grove**

1:00PM

COMBUSTION

Overview: Dr. Thierry Poinsot

Presentation: Dr. Thierry Poinsot and Prof. Luc Vervisch

1:10PM

Jorge Amaya, Benedicte Cuenot and Thierry Poinsot

- Coupling LES, radiation and structure in gas turbine simulations

Florent Duchaine and Thierry Poinsot

- Effects of combustor wall temperature on flame transfer functions

Gabriel Staffelbach, Pierre Wolf, Ramesh Balakrishnan, Thierry Poinsot

- Massively parallel LES
of azimuthal instabilities in helicopter combustion chamber

Evatt Hawkes, Michael Brear, Obulesu Chatakonda, Mohsen Talei, Edward Knudsen, Heinz Pitsch

- Analysis and modeling of premixed turbulent combustion in the thin reaction zones regime

Vincent Moureau, Pascale Domingo, Luc Vervisch, Denis Veynante

- DNS analysis of a Re=40,000 swirl burner

1:40PM

Further discussion

1:50PM

LARGE EDDY SIMULATIONS

Overview and presentation: Prof. Franck Nicoud

2:00PM

Stefan Domino, Frank Ham

- Verification of sliding mesh algorithms for complex applications using MMS

Hubert Baya Toda, Olivier Cabrit, Franck Nicoud, Guido Lodato, Vincent Moureau

- Assessment and improvement of LES for complex aerothermal applications

Roel Verstappen, Sanjeeb Bose

- When does eddy-viscosity damp subfilter scales sufficiently?

Donghyun You, Sanjeeb Bose, Taraneh Sayadi, Adamandios Sifounakis

- Grid-independent large-eddy simulation of compressible turbulent flows using explicit filtering

2:25PM

Further discussion

2:35PM **UNCERTAINTY QUANTIFICATION**
Overview and presentation: Prof. Gianluca Iaccarino

2:45PM *Qiqi Wang, Eric Dow, Frank Ham*
- Stochastic modeling for the K- ϵ model

Piero Colonna, Pietro Congedo, Christophe Corre, Jeroen Witteveen, Gianluca Iaccarino

- Robust simulation of nonclassical gasdynamics phenomena

Alireza Doostan, Qiqi Wang, Paul Constantine

- Statistical inverse analysis of HyShot II flight experiment

Kwok Kai So, Christian Stemmer, Xiangyu Hu, Nikolaus Adams, Tonkid Chantrasmi, Gianluca Iaccarino

- Uncertainty analysis for shock-bubble interaction

3:10PM Further discussion

3:20PM **Coffee break**

3:40PM **HYPERSONICS**
Overview: Prof. Thierry Magin
Presentation: Prof. Thierry Magin and Dr. Olaf Marxen

3:50PM *Anne Bourdon, Khalil Bensassi, Thierry Magin, Alessandro Munafo, Marco Panesi*
- Internal energy excitation and dissociation of molecular nitrogen on hypersonic flows

Sai Hung Cheung, Jeremy Jagodzinski, Kenji Miki, Robert Moser, Marco Panesi, Ernesto Prudencio, Serge Prudhomme, Philip Varghese, Thierry Magin

- Toward the validation of a thermochemical model with EAST shock tube radiation measurements

Yves Dubief, Ryan Crocker

- Study and modeling of non-equilibrium turbulence caused by and ablative flow

Gordon Groskopf, Markus Kloker, Olaf Marxen, Gianluca Iaccarino

- Bi-global stability analysis of hypersonic boundary-layer flows with discrete surface roughness

Olivier Chazot, Thierry Magin, Fabio Pinna, Patrick Rambaud, Alessandro Sanna, Kelly Stephani, Olaf Marxen

- Development on an integrated methodology for the post-flight analysis of the transition payload for the EXPERT mission

4:20PM Further discussion

4:30PM SOLAR PHYSICS

Overview and presentation: Dr. Alan Wray

4:40PM *Friedrich Busse, Thomas Hartlep, Irina Kitiashvili, Alexander Kosovichev, Nagi Mansour, Radostin Simitev, Alan Wray*

- Problems of astrophysical turbulent convection

Igor Rogachevskii, Nathan Kleeorin, Irina Kitiashvili, Alexander Kosovichev, Nagi Mansour, Alan Wray

- LES of turbulent convection in solar-type stars and formation of large-scale magnetic structures

Radostin Simitev, Friedrich Busse, Alexander Kosovichev, Nobumitsu Yokoi, Chunlei Liang

- Coupling of local and global magnetic fields in a turbulent 3D MHD dynamo model on spherical shells

Nobumitsu Yokoi, Guillaume Balarac, Irina Kitiashvili, Nathan Kleeorin, Alexander Kosovichev, Igor Rogachevskii, Radostin Simitev

- Integrated exploration of turbulent cross-helicity effects: theory, observation, modeling, and numerical simulations in the solar convection zone

Guillaume Balarac, Alexander Kosovichev, Olivier Brugiére, Nagi Mansour, Alan Wray

- Improvement of the subgrid-scale turbulence models for realistic numerical simulations of turbulent subsurface dynamics in magnetic regions of the Sun

Irina Kitiashvili, Guillaume Balarac, Friedrich Busse, Nathan Kleeorin, Alexander Kosovichev, Nagi Mansour, Igor Rogachevskii, Alan Wray, Nobumitsu Yokoi

- Modeling of turbulent MHD processes on the Sun

Konstantin Parchevsky, Alexander Kosovichev, Kaori Nagashima, Vyacheslav Olshevsky

- Modeling of generation, propagation, and scattering of acoustic waves in the turbulent convection zone of the Sun

Alexander Kosovichev, Friedrich Busse, Sebastien Couvidat, Keiji Hayashi, Nathan Kleeorin, Igor Rogachevskii, Nobumitsu Yokoi, Junwei Zhao

- Turbulent MHD phenomena on the Sun: testing turbulence models by observations

5:25PM Further discussion