2010 CTR SUMMER PROGRAM
PRESENTATION OF PROGRESS REPORTS
MONDAY, JULY 12, STANFORD UNIVERSITY, ANNENBERG AUDITORIUM (ANNAUD)

Agenda

8:00AM   **Breakfast at the Annenberg Patio**

8:30AM   **UNCERTAINTY QUANTIFICATION**
               Speaker: Prof. Qiqi Wang

Qiqi Wang, Eric Dow
Stochasitc modeling for the K-$\in$ model

Piero Colonna, Pietro Congedo, Christophe Corre
Robust simulation of nonclassical gasdynamics phenomena

Alireza Doostan, Qiqi Wang, Paul Constantine
Statistical inverse analysis of HyShot II flight experiment

Christian Stemmer, Kwok Kai So, Xiangyu Hu, Nikolaus Adams
Uncertain analysis for shock-bubble interaction

8:50AM   Further discussion

8:55AM   **SOLAR PHYSICS**
               Speaker: Dr. Thomas Hartlep, Dr. Alan Wray

Friedrick Busse
Problems of astrophysical turbulent convection

Igor Rogachevskii, Nathan Kleoorin
LES of turbulent convection in solar-type stars and formation of large-scale magnetic structures

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

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

Guillaume Balarac, Alexander Kosovichev, Olivier Brugiere
Improvement of the subgrid-scale turbulence models for realistic numerical simulations of turbulent subsurface dynamics in magnetic regions of the Sun

Irina Kitiashvili
Modeling and data assimilation of turbulent MHD processes on the Sun

Konstantin Parchevsky
Modeling of generation propagation and scattering of acoustic waves on turbulent convection zone of the Sun

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

9:35AM   Further discussion

9:40AM   MULTI-PHASE FLOWS
Speaker: Dr. Olivier Desjardins

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 the effect of local packing and non-sphericity on drag forces acting on the particles

Olivier Desjardins, Vincent Moureau
A two-velocity ghost-fluid method for multi-phase flows with high-density ratio. Application to primary atomization of liquid fuel

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

Stephane de Chaisermartin, Christophe Chalons, Rodney Fox, Lucie Freret, Matthieu Boileau, Frederique Laurent, Marc Massot, Julien Reveillon, Olivier Thomine
Eulerian models for turbulent combustion of polydisperse evaporating sprays: direct numerical simulation and new numerical strategy for LES

10:10AM   Further discussion

10:15AM   Coffee break

10:45AM   LARGE EDDY SIMULATIONS
Speaker: Prof. Franck Nicoud

Donghyun You, William Bromby, Jinmo Lee, Adamandios Sifounakis
Grid-independent large-eddy simulation of compressible flows using explicit filtering

Stefan Paul Domino
Verification of sliding mesh algorithms for complex applications using MMS

Franck Nicoud, Olivier Cabrit, Hubert Baya-Toda
Assessment and improvement of Large Eddy Simulation for complex aerothermal applications

Roel Verstappen
When does eddy viscosity damp subfilter scales sufficiently?

11:05AM   Further discussion

11:10AM   HYPERSONICS
Speaker: Prof. Thierry Magin, Dr. Olaf Marxen

Anne Bourdon, Khalil Bensassi, Thierry Magin, Alessandro Munafo, Marco Panesi
Internal energy excitation and dissociation of molecular nitrogen on hypersonic flows

Yves Dubief, Ryan Crocker
Study and modeling of non-equilibrium turbulence caused by and ablative flow

Gordon Groskopf, Markus Kloker
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
Development on an integrated methodology for the post-flight analysis of the transition payload for the EXPERT mission

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

11:35AM   Further discussion

11:40AM   COMBUSTION
Speaker: Prof. Luc Vervisch

Florent Duchaine, Thierry Poinsot
Effects of combustor wall temperature on flame transfer functions

Vincent Moureau, Pascale Domingo, Luc Vervisch, Denis Veynante
DNS analysis of a Re=40,000 swirl burner

Evatt Hawkes, Michael Brear, Obulesu Chatakonda, Mohsen Talei
Analysis and modeling of premixed turbulent combustion in the thin reaction zones regime

Jorge Amaya, Benedicte Cuenot, Thierry Poinsot
Coupling LES, radiation and structure in gas turbine simulations

Gabriel Staffelbach, Pierre Wolf, Ramesh Balarakrishnan, Thierry Poinsot
Massively parallel LES of azimuthal instabilities in helicopter combustion chambers

12:05PM   Further discussion

12:10PM   BOUNDARY LAYERS
Speakers: Prof. Jim Wallace, Dr. Johan Larsson

James Wallace, Xiaohua Wu
Investigation of the structure and transport processes within the turbulent boundary layer

Julio Soria, Callum Atkinson, Kareem Kilaney
Topology and non-local geometry of wall-bounded flows

George Khujadze, Xiaohua Wu, Martin Oberlack, Kai Schneider
Detection and analysis of coherent structures in turbulent boundary layer flow using wavelets

Jonathan Watmuff, David Pook
Fundamental physical processes associated with bypass transition

John O'Sullivan
1. Examining separated turbulent flow behind a Gaussian ridge/hill using an ASBM model
2. Comparison of the performance of rough wall models and their grid dependence using DNS data

George Jacob
Near-wall mechanics of three dimensional rough-wall turbulent boundary layers

Ronald Adrian, Jon Baltzer, Xiaohua Wu
Proper orthogonal decomposition study of turbulent boundary layer structure

Mihailo Jovanovic, Rashad Moarref
1. Sensitivity analysis of streamwise streaks in channel flows of viscoelastic fluids
2. Model-based feedback flow control

Abdellah Hadjadj
Study of shock/turbulence interactions using high-fidelity numerical simulations. Case of SWBLI at M=2.5

Sergio Pirozzoli, Matteo Bernardini
Analysis of unsteady effects in shock-boundary interactions

1:00PM   Further discussion

1:05PM   ACOUSTICS
Speaker: Dr. Stephane Moreau

Daniel Bodony
Understanding the role of temperature in turbulent jets

Stephane Moreau, Julien Christophe
Uncertainty quantification for low-speed fan noise predictions based on RANS simulations

1:15PM   Further discussion