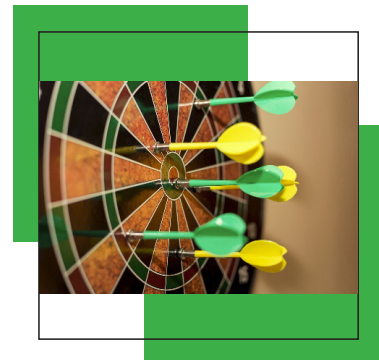


# High Dimensional Hamilton-Jacobi Methods in Control and Differential Games

March 30 -April 3, 2020



## Scientific Overview

Solving Hamilton-Jacobi-Bellman equation is central to problems in optimal control, differential games, path planning and formal verification of reachability sets. As theoretical developments have advanced, computational challenges remain. In this workshop we will discuss recent progress in various computational methodologies for efficient real-time solution of nonlinear HJ equations. Efficient reduced-complexity computation of optimal control solutions, exploiting structure to decompose the solution space to scalable computations and reduced-complexity feedback structures for efficient implementation of optimal controllers based on available data will be explored. Finally, the workshop will focus on how such new methods may be used to broaden the classes of control and differential game problems that may be treated.

The workshop will include a poster session; a request for posters will be sent to registered participants in advance.

## Long Program Schedule

This workshop is part of the long program “High Dimensional Hamilton-Jacobi PDEs.”

- Opening Day: March 9, 2020
- High Dimensional Hamilton-Jacobi PDEs Tutorials: March 10-13, 2020
- Workshop I: High Dimensional Hamilton-Jacobi Methods in Control and Differential Games: March 30-April 3, 2020
- Workshop II: PDE and Inverse Problem Methods in Machine Learning: April 20-24, 2020
- Workshop III: Mean Field Games and Applications: May 4-8, 2020
- Workshop IV: Stochastic Analysis Related to Hamilton-Jacobi PDEs: May 18-22, 2020
- Culminating Workshop at Lake Arrowhead: June 7-12, 2020

## Participation

Additional information about this workshop including links to register and to apply for funding, can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM’s mission, and we welcome their applications.

## Organizers

Jerome Darbon (Brown), Fariba Fahroo (Air Force Office of Scientific Research), Stanley Osher (UCLA), and Claire Tomlin (UC Berkeley).

## Speakers

Marianne Akian (INRIA), Somil Bansal (UC Berkeley), Olivier Bokanowski (Université de Paris VII (Denis Diderot)), Bruce Conway (University of Illinois at Urbana-Champaign), Jerome Darbon (Brown), Peter Dower (University of Melbourne), Weinan E (Princeton), Fariba Fahroo (AirForce Office of Scientific Research), Maurizio Falcone (Università di Roma “La Sapienza”), Helene Frankowska (CNRS), Qi Gong (UC Santa Cruz), William Hager (University of Florida), Sylvia Herbert (UC Berkeley), Matanya Horowitz (AMP Robotics), Wei Kang (Naval Postgraduate School), Matthew Kirchner (UCSB), Arthur Krener (Naval Postgraduate School), Bill McEneaney (UCSD), Ian Mitchell (University of British Columbia), Stanley Osher (UCLA), Claire Tomlin (UC Berkeley), Emmanuel Trelat (Université de Paris I (Panthéon-Sorbonne)), Kyriakos Vamvoudakis (Georgia Tech), Gang George Yin (Wayne State University), and Hasnaa Zidani (ENSTA ParisTech).



For more information, visit the program webpage:  
[www.ipam.ucla.edu/hjws1](http://www.ipam.ucla.edu/hjws1)