



Agenda for the 2002  
Six Month Review of the  
**AFRL/VA and AFOSR**



**Collaborative Center of Control Science (CCCS)**

**The Ohio State University**



Thursday, April 18, 2002

Rooms 259, 260, 263, 267, and 731 Dreese Laboratories  
(For directions, maps, and accommodations see attachments)

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**Collaborative Center of Control Science (CCCS)**

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**Overview of CCCS Activities: (Rm. 260 Dreese Laboratories)**

- 8:00am        Opening Remarks  
                 Prof. Yuan Zheng, Dr. Siva Banda, Dr. Belinda King, Prof. Kevin Passino
- 8:30am        Cooperative Control for UAVs: Overview  
                 Prof. Kevin Passino
- 9:00am        Control of Reusable Hypersonic Launch Vehicles: Overview  
                 Prof. Rama Yedavalli
- 9:30am        Aerodynamic Flow Control: Overview  
                 Prof. Mo Samimy
- 10:00am      Break/Poster Presentations: Overview of Related Funded Projects

**Poster Session: Overview of Related Funded Projects (not CCCS-funded)  
(Hallway outside Rm. 260 Dreese Laboratories)**

- (1) DARPA MICA Program: "OSU DARPA MICA SHARED Program," Prof. Joe Cruz
- (2) DARPA Autonomous Negotiating Teams (ANTS) Program: "Distributed Dynamic Scan Scheduling," Prof. Kevin Passino
- (3) Army Research Office, Army Research Laboratory: "Collaborative Signal Processing for Sensor Networks," Profs. Lee Potter and Randy Moses
- (4) NASA: "Solar Radiation Pressure and Formation Flight in Highly Elliptical Orbits," Prof. Trevor Williams
- (5) AFOSR: "Understanding and Control of Mixing and Noise in High Speed Jets," Prof. Mo Samimy
- (6) DAGSI/AFRL-SN and AFRL-VA: "Prediction and Control of Aero-Optic Aberrations," Prof. Mo Samimy
- (7) DAGSI/AFRL-VA and AFRL-PR: "High Frequency, Inertial Subrange Excitation for Directed Energy, Weapon Bay, and Reacting Flow Applications," Prof. Mo Samimy

**Session I: Cooperative Control for UAVs  
(Rm. 260 Dreese Laboratories)**

- 10:30am Challenge Problems and Principles of Cooperative Control  
Prof. Kevin Passino
- 11:00am Search-Theoretic Foundations for Cooperative UAV Search  
Mike Baum, Prof. Kevin Passino
- 11:30pm Game-Theoretic Approach to Cooperative Search and Engagement  
Sriram Ganapathy, Prof. Kevin Passino
- 12:00pm Lunch/Discussion (Rm. 259 Dreese Laboratories)
- 12:30pm Markov Chain Models for Search/Engagement Games  
Shankar Subramanian, Prof. Joe Cruz
- 1:00pm Distributed Learning and Planning for Cooperative Search  
Prof. Ali Minai, Prof. Marios Polycarpou, Yan Jin, Theju Maddula
- 1:30pm Cooperative Control and Map Building via Surrogate Optimization  
Prof. Raúl Ordóñez, Chunlei Zhang, Shreecharan Kanchanavally,  
Vikramreddy Arjuva
- 2:00pm Distributed Sensor Fusion  
Zaher Kassas, Zhijun Tang, Prof. Ümit Özgüner, Dr. Jeff Layne
- 2:30pm Software Architecture and Communication Networking  
Prof. Ümit Özgüner, Ümit Ogras, Ben Buss, Bruce Weide
- 2:45pm Break
- 3:00pm Artificial Potential Functions and Aerospace Vehicle Formation Flight  
Anees Syed, Prof. Trevor Williams, Prof. David Thompson
- 3:30pm Reconfiguration and Robust Formation Control  
Prof. Andrea Serrani
- 4:00pm AFRL Feedback / Technical Discussion

Demonstrations/Tour: 4:30pm, Rm. 731 DL

- (1) Preliminary work and vision for the “CCCS Cooperative Control Testbed”  
Dr. Keith Redmill, Ümit Ogras, Oguz Dagci, Prof. Ümit Özgüner
- (2) Bioautonomous vehicle progress/demonstration  
Doug Torzewski, Prof. Kevin Passino, Dr. Kevin Daly, Prof. Brian Smith

**Session II: Control of Reusable Hypersonic Launch Vehicles  
(Rm. 267 Dreese Laboratories)**

- 10:30am Nonlinear system stability via a convex combination of stability of linear systems with robust dynamic inversion and its application to aircraft control  
Prof. Rama Yedavalli, Pravin Shanker
- 11:00am Footprint Determination Under Control Effector Failures for the X40A Model  
Vishnuraj Poonamallee, Yang Liu, Prof. S. Yurkovich
- 11:30am AFRL Feedback / Technical Discussion
- 12:00pm Lunch/Discussion (Rm. 259 Dreese Laboratories)
- 1:00pm AFRL Feedback / Technical Discussion

**Session III: Aerodynamic Flow Control  
(Rm. 263 Dreese Laboratories)**

- 10:30 am Simulation of the Test Flow  
Dr. Jim DeBonis, Prof. Mo Samimy
- 11:00am Low Dimensional Modeling of the Test Flow  
Edgar Caraballo, Prof. Mo Samimy
- 11:30am AFRL Feedback / Technical Discussion
- 12:00pm Lunch/Discussion (Rm. 259 Dreese Laboratories)
- 1:00pm Design of Controllers for the Test Flow  
Dr. Onder Efe, Prof. Hitay Ozbay, Xin Yuan
- 1:30pm Design of an Experimental Facility for the Test Flow  
Dr. Marco Debiasi, Prof. Mo Samimy
- 2:00pm AFRL Feedback / Technical Discussion

Gas Dynamics and Turbulence Laboratory Tour:

- 2:30pm Depart from Dreese Laboratories
- 3:00pm Flow Control Laboratory Tour, Discussion on Experimental Component

## CCCS Researchers / Attendees

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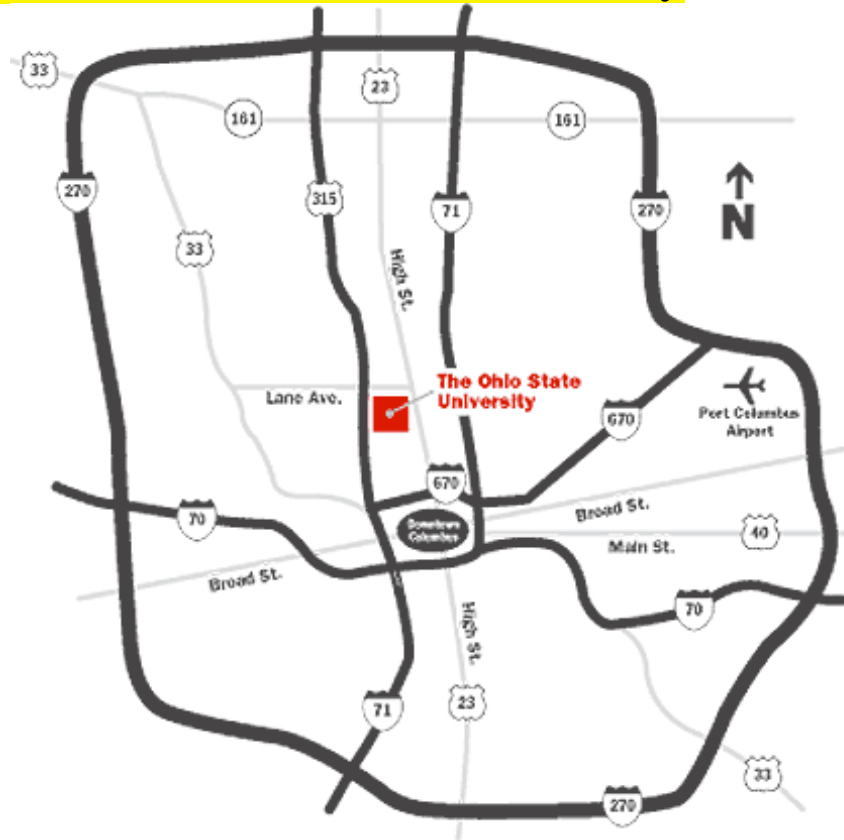
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## Directions to The Ohio State University\*



### **From the north:**

Take any major highway to I-270. Take I-270 to SR 315 south. From SR 315 south, exit at Lane Avenue.

### **From the south:**

Take any major highway to I-71 north. Take I-71 north to SR 315 north. Exit at Lane Avenue.

### **From the west:**

Take any major highway to I-70 east. Take I-70 east to SR 315 north. Exit at Lane Avenue.

### **From the east:**

Take any major highway to I-70 west. Take I-70 west to SR 315 north. Exit at Lane Avenue.

### **From Port Columbus International Airport:**

Take I-670 west. Proceed to SR 315 north. Exit at Lane Avenue.

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\* From OSU Visitor Guide. For more details, if you have access to the web, click [here](#).

## Hotel Information

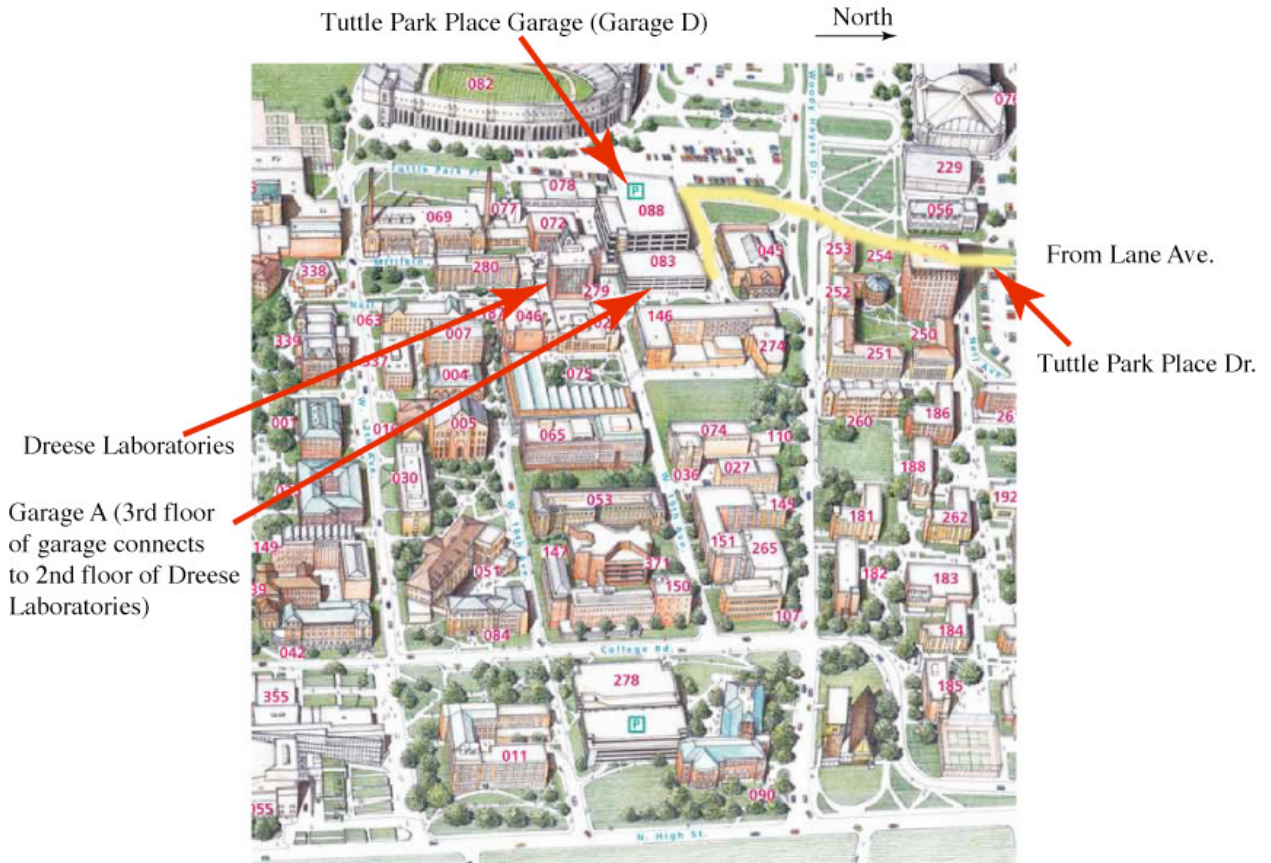
[Holiday Inn on the Lane](#), 328 W. Lane Ave., 614-294-4848; 800-465-4329

Located on the north side of Lane Ave., east of 315 and just west of Tuttle Park Place Ave (see maps).

For more information on accommodations, see <http://www.osu.edu/visitors/>



## Directions to Dreese Laboratory



Go east on Lane Avenue from 315.

Turn right on Tuttle Park Place.

Turn left on Ives Drive, and turn right to Garage A. Third floor of garage connects to Second Floor of Dreese by skyway.

If Garage A is full, return to Tuttle Park Place and turn left. Then turn left into Garage D (Tuttle Park Place Garage). You may walk to Dreese Laboratory, which is nearby, just to the southeast of the Tuttle Park Place Garage (see above map).

Click here for a detailed [map](#) of the Dreese Laboratory neighborhood, if you have access to the web.

# Directions to CCCS Meetings, Dreese Laboratory Second Floor

