



# AIAA NEW ENGLAND SECTION



Thursday, January 22, 2004

## Collaborative Adaptive Sensing of the Atmosphere

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Our ability to monitor, anticipate, and respond to changing circumstances and events is increasingly important, particularly with regard to our physical surroundings. Nowhere is this capability more vital to society, or the challenges associated with its practical implementation greater, than in the context of the atmosphere, where hazardous local weather, such as thunderstorms, tornadoes, and floods – as well as lofted radiological, chemical and biological agents – can, in a matter of minutes or hours, destroy or contaminate life and property over vast areas. Yet, the portion of the atmosphere that contains the bulk of both natural and man-made hazards – the lower troposphere and particularly the atmospheric boundary layer – is grossly under-sampled by today’s sensing technologies.

The Center for Collaborative Adaptive Sensing of the Atmosphere (CASA), a new NSF Engineering Research Center, seeks to revolutionize our ability to observe the lower troposphere through Distributed Collaborative Adaptive Sensing (DCAS). DCAS refers to the use of large numbers of small radars *distributed* to achieve high spatial and temporal resolution throughout the entire troposphere. The radars operate *collaboratively* within a dynamic information technology infrastructure, *adapting* to changing atmospheric conditions in a manner that meets the competing needs of multiple end-users.



Installing DCAS radar networks on cell towers and rooftops defeats the earth curvature problem that limits today’s long-range radar networks and offers the potential to achieve breakthrough improvements in sensitivity and resolution compared to current approaches. These systems promise significant reductions in tornado false-alarms, vastly improved precipitation estimates for flood prediction, fine-scale wind field imaging and thermodynamic state estimation for use in airborne hazard dispersion prediction and other applications.

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**PLACE:** MIT Aero-Astro Building (Bldg 33), Room 33-116, 125 Massachusetts Avenue, Cambridge, MA 02139

**TIME:** 6:15 PM           Appetizers, pizza and soft drinks  
7:00 PM            Presentation

**COST:** Free for student members, \$10 for members, \$15 for nonmembers (FREE if you join AIAA that evening: \$20 for students, \$85 for professionals). Don’t forget your ID card!

**RSVP:** Please contact Ray Erikson to reserve a seat by e-mail: [ray.erikson@flightmaterials.com](mailto:ray.erikson@flightmaterials.com), or phone (781) 246-8239.

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**DIRECTIONS:**

**From I-90 (Mass Turnpike):** Follow I-90 east to the Cambridge/Brighton exit (Exit 18). Following signs to Cambridge, cross the River Street Bridge, and continue straight about 1 mile to Central Square. Turn right onto Massachusetts Avenue and follow Mass Avenue for about a half mile. The main entrance to MIT will be on your left. If you cross the river again, you have gone too far.

**From I-93:** Take Exit 26, and follow signs to Back Bay along Storrow Drive West, approximately 1.5 miles, to the exit for Route 2A. The exit will be on the left, just before the Harvard Bridge (more appropriately called the Massachusetts Avenue Bridge). The Charles River will be on your right. As you cross the bridge, you will be looking at MIT - the Great Dome and academic facilities are on the right, the dormitories and athletic facilities are on the left.

For more information and maps see <http://whereis.mit.edu/map-jpg?selection=33;selectfield=facility;selectlayer=Buildings>