CREW Center for Research and Education in Wind

*CREW Seminar Series: Spring 2010*

# Harnessing the power of the wind

***Abstract***

Wind energy offers the promise of a robust and inexhaustible domestic energy source. Not only do wind turbines provide power with minimal greenhouse gas emissions, but virtually no fresh water is required for power production. Wind energy capacity in the U.S. now produces enough electricity to power the equivalent of approximately 7 million households. Despite impressive recent growth, wind energy still constitutes less than 2% of US electricity sources. Several attainable policy and technical challenges must be surmounted if electricity generated by wind is to provide a significant source of domestic power.

This presentation will highlight approaches to some of these challenges, approaches that draw from atmospheric science and boundary-layer meteorological expertise. As society considers large-scale implementation of wind energy, assessment and consideration of the local environmental impacts of turbines will be required. The integration of large fractions of fluctuating quantities of renewable energy into power grids requires accurate prediction of power availability to balance fluctuations in power sources with fluctuating power demands. These predictions in turn depend on accurate forecasts of wind and atmospheric conditions, nuanced understanding of the impacts of complex terrain on flow and turbulence in the lower atmosphere, and even delineation of the impacts of turbines on each other through turbulent wake effects.

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## By **Julie K. Lundquist from University of Colorado**

## On **Monday, April 26, 2010, at 2:00pm**

## In **Room ECCS 1B28**

(CAETE studio, Engineering Center, University of Colorado at Boulder)

*Refreshments will be available at 1:45pm*

**Julie K. Lundquist**
Assistant Professor, Dept. of Atmospheric and Oceanic Sciences
Fellow, Renewable and Sustainable Energy Institute
University of Colorado at Boulder
Scientist, National Renewable Energy Laboratory, National Wind Technology Center

Prof. Lundquist joined the faculty of the University of Colorado at Boulder in January 2010, with an appointment in the Dept. of Atmospheric and Oceanic Sciences. She also enjoys a joint appointment at the US Department of Energy's National Renewable Energy Laboratory. Her research group uses both observational and computational approaches to explore the fundamental dynamics of the atmospheric boundary layer. Much of her work focuses on wind energy applications, particularly: forecasting of wind resources, modeling wind turbine wakes, quantifying downwind impacts of wind turbines, and assessing climate change impacts on wind resources. She also has interests in urban meteorology and stochastic methodologies for solving inverse problems.

Before joining CU-Boulder as faculty, Dr. Lundquist was a scientist at Lawrence Livermore National Laboratory in the San Francisco Bay Area. She designed and led wind energy projects, as well as atmospheric transport and dispersion modeling and verification projects. She earned her Ph.D. in Astrophysical, Planetary, and Atmospheric Science at CU-Boulder, along with an Environmental Policy Certificate. Her undergraduate studies, in English and Physics, were carried out at Trinity University in San Antonio, Texas.

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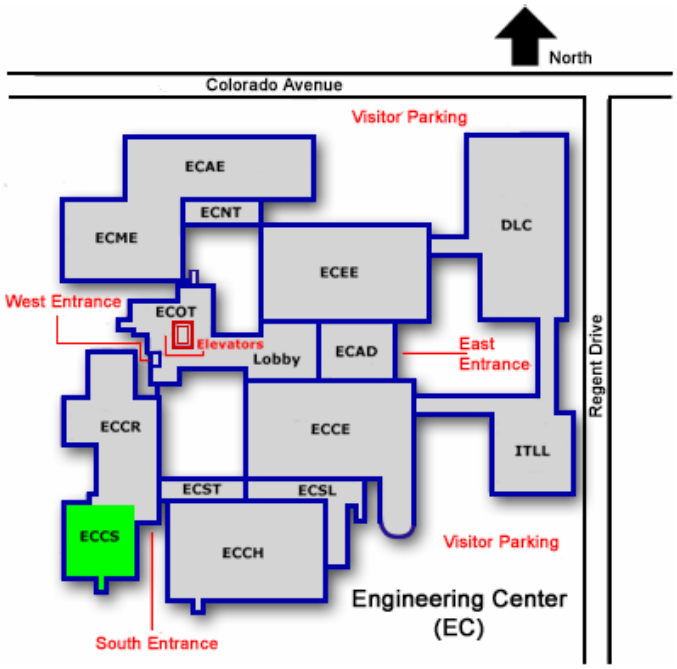
## How to get to the CU-Boulder Engineering Center

From 28th Street (Hwy 36), go west on Colorado Ave., which leads into the University. You will see the Engineering Center on the left, one block further along Colorado Ave.
Parking is available at visitor parking lots and nearby meters.




Room **ECCS 1B28** is located in the 1st basement (courtyard level) of the Computer Science Wind (ECCS).

## Broadcasting option

While we highly encourage students, faculty and researchers to come attend the seminar in person, the seminar will also be broadcast at the following URL:

URL: http://dimdim.cs.colorado.edu
Meeting code: CREW04262010

Unplanned technical problems are always a possibility, so we apologize in advance. Nonetheless, if technical problems are encountered, please feel free to call Mark Dehus at 303-735-6275.

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