

Email not displaying correctly? [View in a Web Browser](#)

# MCRN Newsletter

April 8, 2016 - Issue 14



**MCRN Colloquium Webinar**

**New publications?**

Monday, April 11, 2016, 4pm EDT\*: **Juan Durazo** (Arizona State University) [Webinar Link](#)

*Data assimilation for extreme ionospheric events: observing system experiments of the September 26, 2011 geomagnetic storm*

Abstract: As increasingly sophisticated ground- and space-based technological systems that depend on the near-Earth space environment are being built, vulnerabilities to variations in the ionosphere are also increasing. These vulnerabilities are especially prominent during extreme space-weather events, where satellite communication systems or terrestrial power grid are at risk of being disrupted. Data assimilation has become an essential tool for the specification of ionospheric space-weather, in particular the evolution of its electron density distribution. In this study, we use the Local Ensemble Transform Kalman Filter (LETKF) data assimilation scheme and the Thermosphere-Ionosphere-Electrodynamics Global Circulation Model (TIEGCM) to track and forecast the global electron density distribution during a recent geomagnetic storm in September 26, 2011. Synthetic observations are generated and are assimilated into the ensemble forecast at every hour, using observations available within 30 minutes of analysis time. As a system that is strongly driven by external influences, the quality ionospheric forecasts depends on the estimation of these drivers, which include solar conditions, geomagnetic activity, and the state of the charge-neutral thermosphere, which is intimately coupled with the ionosphere. Thus the data assimilation system employed is extended to estimate these drivers in addition to the electron density state. Results show that the LETKF can adequately handle the inverse problem of using the available observations to estimate the ionospheric drivers that generated them, in addition to estimating the global distribution of electron density during this extreme space-weather event.

\* This talk begins at 20:00 GMT = 10:00 HAST = 13:00 PDT = 13:00 MST = 14:00 MDT = 15:00 CDT = 16:00 EDT = 21:00 BST = 22:00 CEST, and Tuesday, the 12th, at 1:30 IST = 5:00 JST = 5:30 ACST = 6:00 AEST = 8:00 NZST

The following colloquium will be a joint presentation by **Mary Silber** (University of Chicago) and **Karna Gowda** (Northwestern University) on Monday, April 18, 2016, 10am EDT.

Input and update your recent publications [here](#). Need [help?](#)

## News

Partner: [Analytical Foundations for the Next Generation Electric Grid webinars](#)

Network: [Watch EmeraldPlanet program featuring MCRN](#)

Member: [Ken Golden interviewed in Physics Today](#)

Solicitation: [New International Mathematics of Planet Earth \(MPE\) Competition](#)

Solicitation: [Summer Data Science Fellowship Opportunity](#)

## Newsletter FYI

To receive MCRN newsletters, [create an account at mathclimate.org](#), and when setting your profile choose "Yes" to "Receive Email Updates."

To **unsubscribe**, go to your profile at [mathclimate.org](#), and choose "No" to "Receive Email Updates."