

David L. Hysell

Appointments: **Chair**, Department of Earth and Atmospheric Sciences,
Cornell University, 2017 –
Professor, Department of Earth and Atmospheric Sciences,
Cornell University, 2007 –
Associate Professor, Department of Earth and Atmospheric Sciences,
Cornell University, 2002 – 2007
Visiting Professor, Radio Center for Space and Atmosphere,
Kyoto University, 2001
Associate Professor, Department of Physics and Astronomy,
Clemson University, 1998 – 2001
Assistant Professor, Department of Physics and Astronomy,
Clemson University, 1994 – 1998

Preparation: **Postdoctoral research associate**,
Department of Electrical Engineering, Cornell University, 1987 – 1992
Ph.D., Electrical Engineering, Cornell University, Fall, 1992
B.S., Electrical Engineering, Penn State University, Spring, 1987

Research interest:

Hysell investigates ionospheric plasma physics with a focus on plasma instabilities, ionospheric irregularities, and their effects on radio wave propagation. Communication outages caused by ionospheric irregularities are a central component of the National Space Weather Program. The instabilities of interest are found in the equatorial and auroral electrojets, in the midlatitude E region ionosphere, and in equatorial and midlatitude F regions. Research is conducted through experiment, theory, and modeling.

Honors and awards:

Waynick Distinguished Lecture, 2019
Merrill Scholar faculty recognition, 2007
Sonny Yau Excellence in Teaching award, 2006
CEDAR Prize Lecture award, 1999
Recipient, URSI Young Scientist Award, 1996
Recipient, Radio Science Citation for Excellence in Refereeing, 1996

Professional service:

PI, NSF award supporting Jicamarca Radio Observatory, 2005 –
Member, NASA Heliospheric Summer School steering committee, 2015 – 2016
Member, NASA Sounding Rocket Working Group, 2012 – 2015
Member, EISCAT Science Oversight Committee, 2014 – 2015
Chair, CEDAR Science Steering Committee, 2012 – 2014
Member, CEDAR Science Steering Committee, two terms
Member, 2013 Decadal Survey for Solar and Space Physics Steering Committee
Member, NAS Committee for Solar and Space Physics, 2013 – 2014
Member, NAS Committee assessing the role of high-power, high-band transmitters for advancing ionospheric/thermospheric research, 2013

Member, U.S. National Committee for the International Union of Radio Science (URSI), two terms

Member, AGU Executive Committee for Space Physics and Aeronomy (SPA), two terms

Chair, selection committee for the AGU Basu Early Career Award

Member, NCAR Advisory Committee, 2012 – 2014

Member, Polar Aeronomy and Radio Science (PARS) Steering Committee

Associate Editor, Journal of Geophysical Research Space Physics, Radio Science, Radio Science Bulletin

Publications:

ISI shows over 150 peer-reviewed publications for Hysell with over 3000 citations and an *h*-index of 29.

Selected works:

Hysell, D. L. (2018), *Antennas and Radar for Environmental Scientists and Engineers*, Cambridge Univ. Press, Cambridge, U. K.

Hysell, D. L., Munk, J., and McCarrick, M. J. (2019), Investigating transport and dissipation in the subauroral *E* region with ionospheric modification experiments and very high frequency radar backscatter. *Radio Science*, 54, 245–253. <https://doi.org/10.1029/2018RS006749>

Hysell, D. L., Baumgarten, Y., Milla, M. A., Valdez, A., and Kuyeng, K. (2018), Ionospheric specification and space weather forecasting with an HF beacon network in the Peruvian sector. *J. Geophys. Res.*, 123, 6851–6864. <https://doi.org/10.1029/2018JA025648>.

Hysell, D. L., M. F. Larsen, D. C. Fritts, B. Laughman, and M. P. Sulzer (2018), Major upwelling and overturning in the mid-latitude *F* region ionosphere, *Nature-Comm*, 9(3326), 10.1038/s41467-018-05809-x.

Hysell, D. L., Munk, J., and McCarrick, M. (2018), VHF radar images of artificial field-aligned ionospheric irregularities in the subauroral *E* region, *Radio Science*, 53, 334–343. <https://doi.org/10.1002/2017RS006497>.

Current support:

Indoor occupant counting and CO₂ monitoring based on RF backscattering, ARPA-E, 4/26/2018-10/25/2020, \$1,500,000

Theoretical and experimental studies of auroral Farley-Buneman waves, NSF, 8/15/2018-7/31/2021, \$482,594

Space weather and the Jicamarca Radio Observatory, NSF, 2/15/2018-1/31/2023, \$7,254,158

Collaborative research: Combining heating and radio diagnostics on natural aeronomy, NSF, 12/1/2016-11/30/2019, \$75,000

Equatorial ionospheric specification and forecasting with HF beacons, radar, and simulation, AFOSR, 9/30/2016-9/29/2019, \$656,710

Waves and instabilities from a neutral dynamo (WINDY), NASA, 5/18/2015-12/31/2019, \$2,108,543

Collaborative research: Comprehensive investigation of midlatitude ionospheric irregularities, NSF, 7/1/2015-6/30/2019, \$300,001

CEDAR: Auroral electrojet waves and wave heating, NSF, 5/15/2014-4/30/2019, \$361,565

Student advising:

Hysell has chaired the committees of 9 Ph.D. students and advised a number of M.S. and M.Eng. students and postdoctoral associates. Hysell's most recent Ph.D. graduated in 2016.