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### Anne White

Cecil and Ida Green Associate Professor in Nuclear Engineering

[whitea@psfc.mit.edu](mailto:whitea@psfc.mit.edu)

617-253-8667

617-253-0627 (fax)

NW17-111

#### Education

Ph.D. - Physics, University of California, Los Angeles (2008)

M.S. - Physics, University of California, Los Angeles (2004)

B.S. - Physics and Applied Mathematics, University of Arizona, Tucson (2003)

#### Teaching

[22.67](#) Principles of Plasma Diagnostics

[22.012](#) Seminar in Fusion & Plasma Physics

[22.071j/6.071j](#) Electronics, Signals, & Measurement

[6.651/8.613/22.611](#) Intro to Plasma Physics I

[8.03](#) Physics III: Vibrations and Waves (Recitations)

#### Research

Small fluctuations in tokamak plasmas lead to turbulence, and turbulent eddies can very effectively transport heat from the hot core across confining magnetic field lines out to the cooler plasma edge. Predicting this phenomenon of turbulent-transport is essential for the development of fusion reactors. In order to improve predictive capability by testing and validating models of turbulent-transport, detailed measurements of fluctuations in high-performance, reactor relevant tokamak plasmas are required. Diagnostic techniques that allow for simultaneous measurements of fluctuations in plasma density, temperature, and flows in the core and edge of Alcator C-Mod are presently being developed. With these new measurement capabilities we will improve our understanding of how turbulence is suppressed and how the turbulent-transport of particles, energy and momentum can be separated from one another. The new data from these measurements allow for stringent tests of turbulent-transport models. Close collaboration between experiment, theory and simulation is a key aspect of this work.

#### Honors and Awards

- Cecil and Ida Green Career Development Professor, MIT, 2014
- American Physical Society Katherine E. Weimer Award, 2014
- Fusion Power Associates Excellence in Fusion Engineering Award, 2014
- Junior Bose Award for Excellence in Teaching, School of Engineering, 2014
- PAI Outstanding Faculty Award (MIT student chapter of the American Nuclear Society, 2013)
- Norman C. Rasmussen Career Development Professor, NSE Dept., 2012–2014
- Department of Energy Early Career Award, 2011–2016
- Marshall N. Rosenbluth Outstanding Doctoral Thesis Award, 2009
- US Department of Energy Fusion Energy Postdoctoral Research Program Fellow, 2008–2009
- UCLA Graduate Division Dissertation Year Fellowship, 2007–2008
- US Department of Energy ORISE Fusion Energy Science (FES) Fellowship, 2004–2007

#### Professional Societies

#### Research profile:

**Solving Mysteries in the Pursuit of Fusion Power**

#### Labs + Groups

**Plasma Science & Fusion Center**

**MIT Alcator C-Mod**

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#### Video



Research Thumbnail :: Anne White

#### Recent News

**White to receive Excellence in Fusion Engineering Award**

**NSE's Manuel and White to receive awards at annual APS meeting**

**NSE's Professor Anne White wins Junior Bose Teaching Award**

**Understanding the turbulence in plasmas**

**NSE Fusion Program Moves Beyond Plasma, Towards Practical Power-Plant Issues**

**Professor Anne White wins DOE Early Career Research Award**

**A reality check on nuclear fusion at MIT**

- American Physical Society, Division of Plasma Physics (APS-DPP)
- American Nuclear Society (ANS)

### Selected Publications

1. C. P. Kasten, A. E. White, and J. H. Irby, **A new fast two-color interferometer at Alcator C-Mod for turbulence measurements and comparison with phase contrast imaging**, *Phys. Plasmas* 21, 042305 (2014)
2. N. T. Howard, A. E. White, M. Greenwald, C. Holland and J. Candy, **Multi-scale gyrokinetic simulation of Alcator C-Mod tokamak discharges**, *Phys. Plasmas* 21, 032308 (2014)
3. N. T. Howard, A. E. White, M. L. Reinke, M. Greenwald, C. Holland, J. Candy, and J. R. Walk, **Validation of the gyrokinetic model in ITG and TEM dominated L-mode plasmas**, *Nuclear Fusion* 53, 123011 (2013)
4. C. Sung, A. E. White, N. T. Howard, C. Y. Oi, J. E. Rice, C. Gao, P. Ennever, M. Porkolab, F. Parra, D. Mikkelsen, D. Ernst, J. Walk, J. W. Hughes, J. Irby, C. Kasten, A. E. Hubbard, M. J. Greenwald and the Alcator C-Mod Team, **Changes in core electron temperature fluctuations across the Ohmic Energy Confinement Transition in Alcator C-Mod plasmas**, *Nuclear Fusion* 53, 083010 (2013)
5. J. C. Hillesheim, J. C. DeBoo, W. A. Peebles, T. A. Carter, G. Wang, T. L. Rhodes, L. Schmitz, G. R. McKee, Z. Yan, G. M. Staebler, K. H. Burrell, E. J. Doyle, C. Holland, C. C. Petty, S. P. Smith, A. E. White, and L. Zeng, **Experimental characterization of multiscale and multifield turbulence as a critical gradient is surpassed in the DIII-D tokamak**, *Phys. Plasmas* 20, 056115 (2013)
6. D. C. Pace, M. E. Austin, E. M. Bass, R. V. Budny, W. W. Heidbrink, J. C. Hillesheim, C. T. Holcomb, M. Gorelenkova, B. A. Grierson, D. C. McCune, G. R. McKee, C. M. Muscatello, J. M. Park, C. C. Petty, T. L. Rhodes, G. M. Staebler, T. Suzuki, M. A. Van Zeeland, R. E. Waltz, G. Wang, A. E. White, Z. Yan, X. Yuan, and Y. B. Zhu, **Energetic ion transport by microturbulence is insignificant in tokamaks**, *Phys. Plasmas* 20, 056108 (2013)
7. A.E. White, Nathan Howard Martin Greenwald, Matthew Reinke, Choongki Sung, et al., **Multi-channel transport experiments at Alcator C-Mod and comparison with gyrokinetic simulations** (Invited), *Phys. Plasmas* 20, 056106 (2013)
8. N. T. Howard, A. E. White, M. Greenwald, M. L. Reinke, J. Walk, C. Holland, J. Candy, and T. Görler, **Investigation of the transport shortfall in Alcator C-Mod L-mode plasmas**, *Phys. Plasmas* 20, 032510 (2013)
9. C.P. Kasten, J.H. Irby, R. Murray, A.E. White, D.C. Pace, **A new interferometry-based electron density fluctuation diagnostic on Alcator C-Mod**, *Rev. Sci. Instrum.* 83, 10E301 (2012)
10. C. Sung, A. E. White, J. H. Irby, R. Leccacorvi, R. Vieira, C. Y. Oi, W. A. Peebles, X. Nguyen, **Design and first measurements from correlation electron cyclotron emission diagnostic for Alcator C-Mod**, *Rev. Sci. Instrum.* 83, 10E311 (2012)

