TOM F. NEISER

General Atomics, 3550 General Atomics Court, San Diego, CA 92121

Phone: 310-869-6216 ⋄ neisert@fusion.gat.com

EDUCATION

General Atomics (GA)/Oak Ridge Associated Universities (ORAU) August 2019 - present
Postdoctoral Scholar (advisor: Orso Meneghini)

University of California, Los Angeles (UCLA) December 2014 - July 2019
Ph.D. in Physics (advisors: Troy Carter and Frank Jenko)

University of California, Los Angeles (UCLA) 2011 - 2014
M.S. in Physics

Imperial College London 2008 - 2011
B.S. & Associateship of the Royal College of Science in Physics with Theoretical Physics (2:1 Upper second-class honors)

SCECGS Redlands 2006 - 2007
International Baccalaureate (45 points, top 0.05% in Australian Tertiary Admission Rank; valedict.)

EXPERIENCE

General Atomics/ORAU Aug 2019 - present
Postdoctoral Scholar *San Diego, CA*

- Curated a large database of experimental profiles and power balance analyses of DIII-D plasmas using automated workflows in OMFIT
- Validated TGLF saturation rules SAT0, SAT1 and SAT2, and identified strengths and weaknesses
- Applied machine learning tools to help direct future saturation rule development
- Advisors and collaborators: O. Meneghini, S.P. Smith, G.M. Staebler, J. Candy; co-mentee: A. Eubanks

UCLA Dec 2014 - Jun 2019
Graduate Student Researcher *Los Angeles, CA*

- Characterized electron-scale and ion-scale turbulence and their multi-scale interactions in the near-edge of DIII-D L-mode plasmas using the gyrokinetic turbulence code GENE (www.genecode.org)
- Used HPC facilities at NERSC (30 MCPUh); Python, Mathematica and IDL for data processing
- Advisors: Prof.'s Frank Jenko and Troy Carter

UCLA Sep 2011 - Jun 2016
Teaching Assistant *Los Angeles, CA*

- Comprehensive exam discussion sections for graduate students (started wiki: www.physwiki.com/w)
- Discussion Sections: Physics for Scientists & Engineers, Plasma Electronics, Astronomy
- Laboratory Sections: Physics for Life Scientists

Imperial College London Oct 2010 - Jan 2011
Research Student *London, UK*

- Bachelor project on improving fusion reactors with Hydrogen doping
- Carried out numerical integration of the plasma dispersion function using C++
- Advisor: Prof. Steve Cowley

TECHNICAL STRENGTHS

Computer Languages	Python, Mathematica, IDL, C++, Fortran, Bash
Languages	English (fluent), German (fluent)

INVITED TALKS AND SEMINARS

DIII-D Science Meeting, General Atomics, San Diego, CA (Dec 11th, 2020)
APS DPP Student Day, Ft. Lauderdale, FL (2019)
Princeton Plasma Physics Laboratory, Princeton, NJ (2019)
Lawrence Livermore National Laboratory, Livermore, CA (2019)
DIII-D National Fusion Facility, General Atomics, San Diego, CA (2018)
Plasma Science and Technology Institute, University of California, Los Angeles, CA (2015)

PROFESSIONAL DEVELOPMENT

Computational Physics School for Fusion Research, Massachusetts Institute of Technology (2019)
Preparing Future Faculty Class (2018 - 2019)
Machine Learning Reading Group (2018 - 2019)
Physics Education Research Journal Club (2015 - 2016)
Teaching Assistant Training Program (2012)

MENTORSHIP

Co-mentoring with S.P. Smith and O. Meneghini of GA intern A. Eubanks (2020-2021)
Turbulent Transport Journal Group (6 graduate students/year, 2020 - present)
APS Bridge Mentor (1 student/year, 2018 - 2019)
Comprehensive Exam mentor for first year graduate students (25 students/year, 2014 - 2019)
Graduate Student Mentorship Program (1-2 students/year, 2015 - 2019)

AWARDS AND HONORS

3rd Place Poster award at Transport Task Force Meeting, San Diego (2018)
Honorable mention in NSF Graduate Research Fellowship Program (2011)

REFERENCES

Orso Meneghini (meneghini@fusion.gat.com)
Frank Jenko (jenko@physics.ucla.edu)
Troy Carter (tcarter@physics.ucla.edu)

Papers

Reduced transport model development informed by machine learning tools, **T. F. Neiser**, A. Eubanks, O. Meneghini, S. P. Smith, M. Fasciana, G. M. Staebler, J. Candy, PPCF, paper in preparation (2021).

Big data validation of the TGLF saturation rules, **T. F. Neiser**, O. Meneghini, S. P. Smith, M. Fasciana, A. Eubanks, G. M. Staebler, J. Candy, *Phys. Plasmas*, paper in preparation (2021).

Gyrokinetic simulations of turbulence in the near-edge of fusion plasmas, **T. Neiser**, PhD Thesis, UCLA (2019) Permalink: https://escholarship.org/uc/item/4x3429g9

Gyrokinetic GENE simulations of DIII-D near-edge L-mode plasmas, **T. F. Neiser**, F. Jenko, T. A. Carter, L. Schmitz, D. Told, G. Merlo, A. Bañón Navarro, P. C. Crandall, G. McKee and Z. Yan., *Phys. Plasmas* **26**, 092510 (2019). doi: 10.1063/1.5052047

Fermi Degenerate Antineutrino Star Model of Dark Energy, **T. F. Neiser**. *Adv. Astron.* **2020**, 8654307 (2020). doi: 10.1155/2020/8654307

Contributed Talks

Big data validation of the TGLF saturation rules, **T. Neiser**, O. Meneghini, S.P. Smith, A. Eubanks, M. Fasciana, G. M. Staebler, J. Candy, U.S. Transport Task Force Meeting (2021).

TGLF validation with a large-scale power balance database, **T. Neiser**, O. Meneghini, S. P. Smith, A. Eubanks, G. Staebler, J. Candy, 26$^{\text{th}}$ Meeting of the ITPA Transport and Confinement Group (2021).

Big Data Validation of the TGLF Transport Model, **T. Neiser**, O. Meneghini, S. P. Smith, M. Fasciana, G. Staebler, J. Candy, 62$^{\text{nd}}$ Meeting of the APS Division of Plasma Physics (DPP) (2020). Bibcode: 2020APS..DPPZ04007N

Gyrokinetic simulations of DIII-D near-edge L-mode plasmas, **T. Neiser**, F. Jenko, T. Carter, L. Schmitz, G. Merlo, D. Told, A. Bañón Navarro, G. McKee and Z. Yan, 59$^{\text{th}}$ Meeting of the APS DPP (2017). Bibcode: 2017APS..DPPYO4008N

Multi-scale Simulations of DIII-D near-edge L-mode plasmas, **T. Neiser**, F. Jenko, T. Carter, L. Schmitz, D. Told, A. Bañón Navarro, G. McKee and Z. Yan, 58$^{\text{th}}$ Meeting of the APS DPP (2016). Bibcode: 2016APS..DPPTO9011N

ETG-dominated transport regimes in near-edge DIII-D L-mode plasmas: Validation of multiscale gyrokinetic simulations, **T. Neiser**, F. Jenko, L. Schmitz, D. Told, A. Bañón Navarro, T. Carter, Z. Yan and G. McKee, 57$^{\text{th}}$ Meeting of the APS DPP (2015). Bibcode: 2015APS..DPPUO5011N

Contributed Posters

An Empirical Neural Network Transport Model Fit to a Large DIII-D Database, A. Eubanks, O. Meneghini, S. P. Smith, **T. F. Neiser**, 62$^{\text{nd}}$ Meeting of the APS DPP (2020). Bibcode: 2020APS..DPPZ08011E

Indirect evidence for a hybrid ITG/TEM scenario in nonlinear simulations of a DIII-D near-edge L-mode plasma, **T. F. Neiser**, F. Jenko, T. A. Carter, L. Schmitz, P. C. Crandall, G. Merlo, D. Told, A. Bañón Navarro, Z. Yan and G. R. McKee, 61$^{\text{st}}$ Meeting of the APS DPP (2019). Bibcode: 2019APS..DPPP10125N

Cosmological implications of a degenerate antineutrino star, **T. F. Neiser**, 233$^{\text{rd}}$ Meeting of the American Astronomical Society (2019). Bibcode: 2019AAS...23334908N

Characterizing near-edge DIII-D L-mode plasmas with gyrokinetic GENE simulations, **T. F. Neiser**, F. Jenko, T. A. Carter, L. Schmitz, P. C. Crandall, G. Merlo, D. Told, A. Bañón Navarro, G. R. McKee and Z. Yan, 60$^{\text{th}}$ Meeting of the APS DPP (2018). Bibcode: 2018APS..DPPN11064N

GENE simulations of near-edge L-mode plasmas in DIII-D: Can gyrokinetics recover the experimental heat fluxes?, **T. F. Neiser**, F. Jenko, T. A. Carter, L. Schmitz, G. Merlo, D. Told, A. Bañón Navarro, P. C. Crandall, Z. Yan and G. R. McKee, U.S. Transport Task Force Meeting, San Diego (2018).

LH Transition Dynamics in ITER-Similar D, He, and H Plasmas, L. Schmitz, T.L. Rhodes, **T. Neiser**, L. Zeng, Z. Yan, G. R. McKee, P. Gohil, L. Bardoczi, D. Eldon, C. C. Petty, B. Grierson, 59$^{\text{th}}$ Meeting of the APS DPP (2017). Bibcode: 2017APS..DPPG11094S

Towards a Physics-Based LH Transition Model, L. Schmitz, T. L. Rhodes, **T. Neiser**, L. Bardoczi, F. Jenko, L. Zeng, P. Gohil, C. Chrystal, B. A. Grierson, D. Eldon, Z. Yan, G. R. McKee, J. Boedo, 58$^{\text{th}}$ Meeting of the APS DPP (2016). Bibcode: 2016APS..DPPJ10110S

Computational analysis of two-fluid edge plasma stability in tokamak geometries, **T. Neiser**, D. Baver, T. Carter, J. Myra, P. Snyder, M. Umansky, 55$^{\text{th}}$ APS DPP (2013). Bibcode: 2013APS..DPPPP8034N

Two-fluid edge plasma stability analysis in divertor tokamak geometry, **T. Neiser**, D. Baver, T. Carter, J. Myra, P. Snyder, M. Umansky, 54$^{\text{th}}$ APS DPP (2012). Bibcode: 2012APS..DPPBP8150N