Donald A. Spong

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Education
University of Michigan - Ph.D. in Nuclear Engineering (1976), Master of Science in Nuclear Engineering (1971), University of Arizona - Bachelor of Science in Nuclear Engineering (1970)

Synergistic Activities
ITPA-EP group leader (2018-2020); ITPA-EP deputy group leader (2016-2018); JIFT US-Japan visiting professor (2016 and 2007); IAEA 2016 Fusion Energy Conference program committee - U.S. Theory representative; U.S. DOE proposal reviewer; scientific advisor to Type One Energy.

Research and Professional experience:
Oak Ridge National Laboratory, Fusion Energy Division, Scientific Staff member (1975 – present).

Oak Ridge National Laboratory, Fusion Energy Division, Associate Development Engineer (Summer employment, summers of 1972, 1973).

Argonne National Laboratory, National Reactor Testing Station, Idaho Falls, Idaho; Summer student assistant on Zero Power Plutonium Reactor (1969).

Graduate and Postdoctoral Advisors and Advisees: Phd Advisor: Terry K. Kammash (retired, University of Michigan), Recent post-doctoral associates: Yashika Ghai (ORNL), Jacobo Varela Rodriguez (Universidad Carlos III de Madrid).

Academic and Professional Honors: 2021 Fusion Power Associates Distinguished Career Award, 2020 UT-Batelle/ORNL Distinguished Researcher Award; American Physical Society Fellow (2016); 2001 UT-Battelle/ORNL Science and Technology Award; 1988 Martin Marietta/ORNL publications Award; 1994 Martin Marietta/ORNL Author of the Year Publication Award; Visiting professor at National Institute for Fusion Science, Toki, Japan for 2007 and 2016.

Research Experience: Runaway electron physics in tokamaks, transport in non-axisymmetric toroidal devices and stability of bumpy torus plasmas with supra-thermal electron components; high-toroidal mode number stability of ignited tokamaks with an energetic alpha component; neoclassical MHD stability and turbulence in toroidal plasmas; hybrid fluid-kinetic models for stability of ignited tokamaks with an energetic alpha component; simulation of inductively-coupled plasma processing devices for semiconductors; stellarator configuration optimization and transport/confinement analysis of compact stellarator devices; energetic particle physics and Alfvén wave stability in tokamaks, stellarators and reversed field pinches, gyrofluid and gyrokinetic models for Alfven instabilities.

Selected Publications

"Nonlinear dynamics and transport driven by energetic particle instabilities using a gyro-Landau closure model," D.A. Spong, M.A. Van Zeeland, W.W. Heidbrink, X. Du, J. Varela, L. Garcia and Y. Ghai, Nuclear Fusion **61** (2021) 116061.

"*First Direct Observation of Runaway-Electron-Driven Whistler Waves in Tokamaks*," Spong, D.A.; Heidbrink, W.W.; Paz-Soldan, C.; Du, X.D.; Thome, K.E.; Van Zeeland, M.A.; Collins, C.; Lvovskiy, A.; Moyer, R.A.; Austin, M.E.; Brennan, D.P.; Liu, C.; Jaeger, E.F.; Lau, C., Physical Review Letters, **120**, n 15, 2018.

"*Global linear gyrokinetic simulation of energetic particle-driven instabilities in the LHD stellarator*," D.A. Spong, I. Holod, Y. Todo and M. Osakabe, Nuclear Fusion **57** (2017) 086018.

"*Analysis of Alfvén eigenmode destabilization by energetic particles in Large Helical Device using a Landau-closure model*," J. Varela, D.A. Spong and L. Garcia, Nuclear Fusion **57** (2017) 046018.

"*3D toroidal physics: testing the boundaries of symmetry breaking*," D. A. Spong, Physics of Plasmas **22**, 055602 (2015).

"*Simulation of Alfvén frequency cascade modes in reversed shear-discharges using a Landau- closure model*," D. A. Spong, Nuclear Fusion **53**, 053008 (2013).

"*Verification and validation of linear gyrokinetic simulation of Alfven eigenmodes in the DIII-D tokamak*," D. A. Spong, E. M. Bass, W. Deng, W. W. Heidbrink, Z. Lin, B. Tobias, M. A. Van Zeeland, M. E. Austin, C. W. Domier, N. C. Luhmann, Jr., Phys. Plasmas **19** (2012) 082511.

"*Energetic-Particle-Driven Instabilities in General Toroidal Configurations*," D. A. Spong, B. N. Breizman, D. L. Brower, Ed D'Azevedo, C. B. Deng, A. Konies, Y. Todo, and K. Toi, Contributions to Plasma Physics, **50** (2010) 708-712.

"*Clustered frequency analysis of shear Alfvén modes in stellarators*," D. A. Spong, E. D'Azevedo, and Y. Todo, Phys. of Plasmas **17** (2010) 022106.

"*Shear Alfvén Continua in Stellarators*," D. A. Spong, R. Sanchez, A. Weller, Phys. of Plasmas, **10**, pg. 3217, August, 2003.