Donald A. Spong

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Education

University of Michigan

Ph.D. in Nuclear Engineering, Master of Science in Nuclear Engineering

University of Arizona

Bachelor of Science in Nuclear Engineering

Research Interests

Plasma confinement and particle trajectories in 3-D magnetic geometries, Monte Carlo simulation of thermal and energetic particle transport, magnetic configuration optimization, energetic particle driven Alfvén instabilities in fusion devices, plasma gyro-fluid and gyro-kinetic simulation, scientific visualization, parallel computing.

Major Technical Activities while at ORNL: Transport in non-axisymmetric toroidal devices (EBT) and stability of bumpy torus plasmas with superthermal 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 and 3D configurations.

Other non-Technical Activities while at ORNL: Fusion Energy Division Honors and Awards Coordinator, Member of the ORNL Library Advisory Committee, Lecturer for the USDOE/ORAU Traveling Lecture Program, Local Arrangements Chairman for the 1988 American Physical Society Division of Plasma Physics Meeting, Member of Oak Ridge Associated Universities Advisory Committee for the DOE Office of Fusion Energy Manpower Development programs, Supervisor for a number of ORISE summer students

Professional Memberships: American Physical Society, Sigma Xi, Tau Beta Pi

National Committees: DIII-D Program Advisory Committee, Program Advisory Committee for National Energy Research Supercomputing Center (NERSC), ITER Expert Group on Energetic Particles, Reviewer of Plasma Theory proposals for Office of Fusion Energy, DOE.

Previous Scientific/Engineering Employment: Argonne National Laboratory, National Reactor Testing Station, Idaho Falls, Idaho; Summer student assistant on Zero Power Plutonium Reactor; Oak Ridge National Laboratory, Fusion Energy Division, Associate Development Engineer (Summer employment).

Academic and Professional Honors: Tau Beta Pi, Phi Kappa Phi, AEC Special Fellowship, Oak Ridge Associated Universities Laboratory Graduate Fellowship, Phi Eta Sigma, 1988 Martin Marietta/ORNL publications Award, 1994 Martin Marietta/ORNL Author of the Year Publication Award.

Selected Publications

"*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, et al., Phys. Plasmas Vol. **19** (2012) 082511-1.

"*3D effects on energetic particle confinement and stability*," D. A. Spong, Physics of Plasmas **18**, 056109 (2011).

"*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.

"*QPS Transport Physics Flexibility using Variable Coil Currents*," D. A. Spong, et al., Fusion Science and Technology **46** 215 (2004).

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

"*Physics Issues of Compact Drift-Optimized Stellarators*," D. A. Spong, et al., Nuclear Fusion Vol. 41, No. 5, 2001.

"*Strategies for Modifying Alpha Driven TAE Thresholds Through q Profile and Ion Temperature Control,*" D. A. Spong, C. L. Hedrick, B. A. Carreras, Nuclear Fusion Vol. 35 (1995) 1687.

"*Nonlinear Evolution of the Toroidal Alfvén Instability using a Gyrofluid Model*," D. A. Spong, B. A. Carreras, C. L. Hedrick, Phys. Plasmas 1, 5 (1994).

"*Gyrofluid Model of the Alpha Destabilized TAE Mode with Continuum Damping Effects*," D. A. Spong, B. A. Carreras, C. L. Hedrick, Phys. Fl. B 4, 3316 (1992).

"*Anisotropy Effects on Curvature-Driven Flute Instabilities in a Hot Electron Plasma*," D. A. Spong, H. L. Berk, J. W. Van Dam, M. N. Rosenbluth, Phys. Fluids **26**, 2652 (1983).

"*Runaway Electrons in Toroidal Discharges*," (review paper) H. Knoepfel, D. A. Spong, Nuclear Fusion **19** (1979) 785.