Dan Ilas, Ph.D.
Criticality & Shielding Methods & Applications Group
Nuclear Science and Technology Division
Oak Ridge National Laboratory, P.O. Box 2008 MS-6170, Oak Ridge TN 37831-6170
Street Address: 1 Bethel Valley Road, Oak Ridge, TN 37831-6170
Ph: (865) 576-9119   Fax: (865) 576-3513
Email: ilasd@ornl.gov

EDUCATION

Georgia Institute of Technology, Atlanta, Georgia
Ph.D., Nuclear Engineering, May 2001   GPA 4.0/4.0
Thesis: *Coarse Mesh Transport Theory Model for Heterogeneous Systems*
Minor: Physics
Advisor: Dr. Farzad Rahnema

University of Bucharest, Bucharest, Romania
M.S, Engineering Physics, June 1986   GPA 9.64/10.00
Thesis: *The Study of Two-Photon Processes for Transitions Discrete-Continuum in Hydrogen-Like Atoms*
Advisor: Dr. Adrian Costescu

WORK EXPERIENCE

Oak Ridge National Laboratory, Oak Ridge, Tennessee   (11/04-present)
R&D Associate
TORT integration into SCALE.
Monte Carlo dosimetry modeling and computations for medical workers.

Georgia Institute of Technology, Atlanta, Georgia   (10/03-9/04)
Postdoctoral Fellow
Dual appointment. Half with the School of International Affairs (Sam Nunn Security Fellows Program sponsored by MacArthur Foundation) on nonproliferation issues associated with nuclear reactors.
The other half with the Nuclear and Radiological Engineering Program, working on a transport method for dose calculation in cancer treatment, project sponsored by Georgia Cancer Coalition.

Louisiana State University, Baton Rouge, Louisiana   (6/01-9/03)
Postdoctoral Researcher
Investigation on adapting a method-of-characteristics code previously used for nuclear reactor calculations to radiation therapy problems. The research included implementing the physics associated with the transport of highly anisotropic photon beams, dealing with combinatorial geometry, and code optimization. Benchmarking was performed against MCNP.
Studied the impact of neutron streaming on internal structural damage in a BWR, under contract with EPRI.

Georgia Institute of Technology, Atlanta, Georgia
Graduate Research Assistant   (9/95-12/98)
Research sponsored by General Electric on improving the nodal diffusion methods to account for environmental effects and the implementation of these new methods into nodal codes.
Developed numerical benchmarks for the effects of moderator and fuel properties on the eigenvalue for BWR lattice cells, using MCNP and NJOY.
Benchmarked HELIOS library for BWR analysis using MCNP.
Wrote and used codes to verify perturbational formulae for Wigner-Seitz cells and other boundary perturbations; the estimated disadvantage factors at different types of boundary conditions have been benchmarked against the corresponding MCNP estimates.
DEC Alpha and SUN workstations, and PC's management.

<u>Graduate Teaching Assistant</u>   (1/99-5/01)
"Radiation Technology Laboratory" (graduate level) – set up experiments, supervised students, graded lab reports.
"Computing Techniques" (undergraduate level) – graded projects and homework, assisted students, problem sessions lecturer.
Computer lab assistant – duties included helping students with engineering software

<u>Thesis work</u>   (9/95-5/01)
Development of a coarse mesh transport method for heterogeneous systems based on a finite element-like approach. The method was proved to reproduce the one-dimensional fine mesh transport calculations exactly, while the computation time was only a fraction of the time for fine mesh calculation.

Institute for Nuclear Physics and Engineering, Bucharest, Romania
<u>Researcher</u>   (6/91-9/95)
Worked on the decommissioning of the VVR research reactor in Bucharest on a contract with IAEA Vienna: performed core calculations, evaluated radioactivity of the immersed components, developed and used different computer codes to process the data. Adapted TWOTRAN for UNIX and PC-386 (DOS) systems and ORIGEN on Digital VMS and PC systems. Interfaced TWOTRAN and ORIGEN to automatically compute the radioactive inventory of a VVR reactor. Worked on neutron flux spectra determination by multiple foil activation method and adapted SAND-II for VMS and PC platforms.

<u>Nuclear Engineer</u>   (11/89-6/91)
Research on using boron carbide for fast breeder reactors control (joint research with IPPE Obninsk, Russia).

Institute for Nuclear Research (former Institute for Nuclear Power Reactors), Pitesti, Romania
<u>Nuclear Engineer</u>   (6/86-11/89)
Computational simulation of the immersion of the shutdown system's rods for a CANDU power reactor using specific kinetics codes. Studied the effect of different parameters on the fuel burnup for a CANDU reactor using a fuel management code. Studied the influence of xenon accumulation on the power level for a CANDU reactor.

CONSULTING WORK

Canadian Nuclear Safety Commission   (10/03-present)
Transport calculations using 3-D geometry transport codes for transient analysis of a postulated LOCA accident.

RESEARCH INTERESTS

Nuclear reactor core analysis methods and software development. Transport and dose evaluation methods and cross-section generation for nuclear applications.

SKILLS

<u>Programming Languages</u>: FORTRAN, MATLAB, C, BASIC, ASSEMBLER
<u>Operating Systems</u>:   DOS, WINDOWS, UNIX, VMS
<u>Computational Tools</u>:   MCNP, NJOY, HELIOS, DORT, TWOTRAN, ORIGEN, SAND-II, WIMS, ANISN, TransMED, POWDERPUFS, CHEBY, CHEBXEMAX, CERBERUS
<u>Foreign Languages</u>:   Romanian (native), French (reading).

PROFESSIONAL SOCIETIES

American Nuclear Society
Alpha Nu Sigma, honor society

PUBLICATIONS AND CONFERENCE PRESENTATIONS

D. Ilas, S. Mosher, F. Rahnema, D. Serghiuta, H. Sarsour, P.J. Turinsky, R. Stamm'ler, "Reconstruction of Intra-Bundle Fission Density Profile During a Postulated LOCA in a CANDU Reactor," accepted, PHYSOR-2006, September 10-14, 2006, Vancouver, BC, Canada.

D. Ilas, S. Mosher, F. Rahnema, D. Serghiuta, H. Sarsour, P.J. Turinsky, "Relative Effects of Simulation Methods on Predictions of Physics Parameters of a Generic ACR-700 Core," accepted, PHYSOR-2006, September 10-14, 2006, Vancouver, BC, Canada.

M.L. Williams, **D. Ilas**, E. Sajo, D.B. Jones, K.E. Watkins, "Deterministic Photon Transport Calculations in General Geometry for External Beam Radiation Therapy," *Med. Phys*. **30**, pp. 3183-3195 (2003).

D. Ilas, F. Rahnema, "A Heterogeneous Coarse Mesh Transport Method," *Transport Theory and Statistical Physics*, **32**(5-7), 445-471 (2003).

F. Rahnema, S. Mosher, **D. Ilas**, C. de Oliveira, M. Eaton, R. Stamm'ler, "3D Heterogeneous Transport Calculations of CANDU Fuel with EVENT/HELIOS,*"* 22nd Nuclear Simulation Symposium: Nuclear Power Reactors - Step Into the Future, Ottawa, Canada, November 2002.

D. Ilas, F. Rahnema, "An Improved Coarse Mesh Transport Method for Criticality Calculations" (invited), *ANS Trans.* **85**, 285 (2001).

D. Ilas, F. Rahnema, "A Coarse Mesh Transport Method for Heterogeneous Systems*,"* International Conference on Mathematical Methods to Nuclear Applications, Salt Lake City, UT, USA, September 9-13, 2001.

F. Rahnema, G. Pomraning, **D. Ilas**, "Wigner-Seitz Cell Approximation – Revisited"(invited), *Proc. International Conference on Mathematics and Computation, Reactor Physics, and Environmental Analysis in Nuclear Applications*, Madrid, Spain, September 27-30, 1999.

D. Ilas, F. Rahnema, "HELIOS Library Benchmark for BWR Analysis," *ANS Trans.* **76**, 370 (1997).

F.Rahnema, **D. Ilas**, S. Sitaraman, "BWR Benchmark Calculations," *Nuc. Technol*. **117**(2), 184 (1997).

I. Garlea, C. Turcanu, D. Mocioiu, M. Ion, D. Ene, C. Postelnicu, **D. Ilas**, D. Dogaru, R. Margineanu, P. Stanescu, C. Popescu, S. Paun, "Main Problems Regarding the Decommissioning of VVR-S Research Reactors," *Romanian J. Phys.* **40**, 4-5 (1995).

D. Ene, **D. Ilas**, M. Dumitriu, "Testing of IPNE Calculation System on the Mono-Dimensional Model of the BN-600 Reactor," Romanian National Physics Conference, Iasi, Romania, September 21-24, 1992.

OTHER PRESENTATIONS

*"*Rehomogenization of Cross Sections in PANACEA by Flux Modulation,*"* presented at General Electric, Wilmington, NC, 1998.

TECHNICAL REPORTS (selected)

D. Ilas, M.L. Williams, "Comparison of Heterogeneous and Homogeneous Transport Models for Predicting Radiation Exposure Above a BWR Core," Louisiana State University, EPRI report, 2004.

F. Rahnema and Dan Ilas, "An Advanced Two-Group Diffusion Theory Model for PANACEA" Georgia Institute of Technology, Final Technical Report Prepared for GE Nuclear Energy, 1998.

I. Garlea, D. Ene, D. Mocioiu, D. Ilas, "Evaluation of Radioactivity of the Immersed Components for Decommissioning of the Magurele VVR-S Research Reactor," Institute for Nuclear Physics and Engineering, Bucharest, Romania, 1995.

I. Garlea, D. Ene, D. Mocioiu, D. Ilas, "Transport Computations for the Use of Boron Carbide for Fast Breeder Reactors Control," Institute for Nuclear Physics and Engineering, Bucharest, Romania, 1992.

D. Ilas, "The Effect of the Fluctuation of Different Parameters on the Fuel Burnup for a CANDU Reactor," End of Junior Stage Paper, Institute of Nuclear Power Reactors, Pitesti, Romania, 1989.

D. Ilas, et al., "The Influence of Xenon Accumulation on the Power Level of a CANDU Reactor," Institute of Nuclear Power Reactors, Pitesti, Romania, 1989.

D. Ilas, et al., "Simulation of the Shut-Down System #1 Test. Coverage of the Working Scenario with Values", RI-2453, Institute of Nuclear Power Reactors, Pitesti, Romania, 1988.

I. Dumitrache, D. Ilas, et al., "Adjustor Rod Design for CNE Cernavoda 2," RI-2152, Institute of Nuclear Power Reactors, Pitesti, Romania, 1986.