January 6, 2020

Erez Gilad – Short Bio

Position and expertise: I am the head of the Reactor Physics Group at Ben-Gurion University of the Negev (senior lecturer, since 2014). I am particularly interested in fundamental core physics, including experimental core physics, neutron transport theory, and in-core fuel management. Currently, my main research efforts include the study and development of representative experiments for neutronic effects during severe core accidents in Gen-IV fast reactors, novel transport corrections for the multigroup neutron diffusion equation, novel quasi-static methods for calculations of neutronic transients, advanced analysis techniques for zero-power neutronic experiments in critical and subcritical facilities, and innovative evolutionary algorithms for core design optimization.

Background: I obtained my Ph.D. in theoretical physics (Summa Cum Laude, Dean's award for academic excellence) from Ben-Gurion University of the Negev in 2006 for my studies on nonlinear dynamics and pattern formation in complex systems. During my post-doctoral studies at the mathematical biology group in Royal Holloway College, University of London, I focused on complexity and emergent collective behavior and studied the dynamics of epidemic outbreaks on complex biological and social networks. Between 2009-2014 I served as a senior physicist of IRR2 at the Nuclear Research Center NEGEV (NRCN), which involved physical core design, fuel cycle calculations, design and analysis of neutronic experiments, and safety analysis.

Singularity: I am a nonconventional theoretical physicist with a unique and diverse professional background. My experience in different scientific disciplines facilitates my interdisciplinary approach, which I believe is crucial for modern and innovative reactor physics research. My skills as a theoretical reactor physicist together with hands-on experience in reactor safety and operation constitute a significant advantage in conducting pertinent and applicable reactor physics research. I have been holding pivotal positions in academia, national research laboratories, industry, the private sector, and military.

Publications: So far, I have published 33 articles in peer-reviewed scientific journals, co-authored 2 contributed chapters, was cited ~1750 times and contributed over 40 papers to leading conferences in my field. The full list of publications can be found here: Google scholar, My website

Funding: In the last 5 years, I have received 9 research grants as the PI from Israel MOE and PAZY foundation and I am closely collaborating with reactor physics groups in Europe (Politecnico di Torino & CEA) and in the US (University of Austin, Texas). Total funding obtained so far: ~1,430,000$. Main grants so far:

1) 2016-2018, MOE, 383,000 NIS, **PI: E. Gilad**, Neutronic effects during severe core accidents
2) 2016-2017, PAZY, 530,000 NIS, **PIs: E. Gilad, I. Neder** (SNRC): Burnup calculations of IRR1
3) 2017-2019, MOE, 600,000 NIS, **PI: E. Gilad**, Optimization algorithms for nuclear core design
4) 2020-2022, MOE, 370,000 NIS, **PI: E. Gilad**, Quasi-static calculation of neutronic transients
5) 2020-2022, MOE, 750,000 NIS, **PIs: E. Gilad**, Shlomi Pistinner, EPZ for NuScale SMR bomb hit

Other achievements: I am a member of the High Scientific Council of the European Nuclear Society (ENS), a member of the organizing committee of several international conferences, an ad-hoc reviewer for leading scientific journals (e.g., Nucl. Technol., Ann. Nucl. Energy, Scientific Reports, International Journal of Energy Research), an invited staff lecturer at the FJOH international summer school, an invited speaker at the PHYTRA4 international conference, the PI of the BGU-CEA international scientific collaboration, a visiting professor at Politecnico di Torino, guest editor in PHYSICA D, and supervised 10 M.Sc. and 1 Ph.D. (Dean's award) alumni.