

CURRICULUM VITAE – Efi Zemach

Education

- 2013-2016 **Ph.D.** *Mechanical Engineering, Ben-Gurion University.*
- 2009-2012 **M.Sc.** (Summa Cum Laude) *Mechanical Engineering, Tel-Aviv University, Israel, (final grade 97).*
- 2001-2005 **B.Sc.** (Summa Cum Laude) *Mechanical Engineering, Technion Institute of Technology, Israel, (final grade 93).*

Ph.D. Research

- Title Study of turbulent flow and heat transfer properties in Liquid metals subjected to magnetic field
- Supervisor Prof. Semion Sukoriansky
- Description A Quasi-Normal Scale Elimination (QNSE) theory is developed for MHD turbulent flow in order to establish consistent coarse-graining procedure yielding the effective viscosities and diffusivity and energy spectra. Pseudo-spectral DNS code was developed for the purpose of comparison with theoretical results.

M.Sc. Research

- Title Heat Transfer Enhancement in Micro-Scales Flow
- Supervisor Prof. Moshe Rosenfeld
- Description The limitation of air cooling capabilities in micro-channels is extended by a novel method using vortex-ring wall interaction in compressible flow. The new method was studied using numerical methods (CFD).

Employment History

- 2017 - **Headmaster of Development Engineering Group, Soreq - Nuclear Research Center (SNRC).** In-charge of mechanical, analysis and manufacture Groups. Responsibility on major research projects, research laborites and cooperation with the academic institutes.
- 2010-2016 **Headmaster of Analysis Group, Soreq - Nuclear Research Center (SNRC)**
Manager of analysis group and responsible of all engineering simulations: mechanical, flow, heat transfer, FSI (fluid structure interaction) and dynamics simulations. Assimilation of structural analysis in SNRC researchers and establishment of software and hardware facilities for high performance computation. Leading numerical research in the field of

turbulent flow and heat transfer. Performing simulations for all SNRC departments: SARAF accelerator, SNRC Reactor, Optics and laser, destruction test. Developing multi-disciplinary systems for SARAF accelerator [5, 6, 7].

2008-2010 **Flow & Heat transfer Engineer**, *Elbit Systems - Elop division*, heat transfer and structural analysis group.

Short description of activities:

- Leading projects from the heat transfer aspect from DR to CDR. Thermal design and numerical analysis of cooling systems for high and low power **laser. Temperature stabilization of laser using combined** system of TEC (Thermoelectric cooler) with micro-channels and heat-sinks.
- CFD analysis for sub/supersonic external turbulent flow. Aerodynamics drag forces. Pressure drop for internal flows. Aero-optics disturbances in turbulent flow.
- Developing various in-house software codes: code for TEC performance in transient stage. Semi-empirical code for calculation heat-sink & fan performance and optimization for the combined system.

2004-2008 **Flow & Heat transfer Researcher**, *Rafael - Advanced Defense Systems LTD. Missile division*, heat and mass transfer department

Short description of activities:

- Thermal design of electronic systems, Flow simulations, experiments and numerical model calibrations, aerodynamics heating.
- CFD analysis for reactive under-expansion jets in supersonic turbulent flow for thermal signature.
- Experiments for characterization thermal properties of composite materials.
- Advanced radiation heat transfer models with optimization and probability design.

Academic Experience

2018 – 2013-2014 **Lecturer**, Department of Mechanical Engineering, SCE College.

Research students:

- 2018- **Liron Danon** - Ph.D. thesis Properties of turbulence flow over corrugated surface. (Co-supervised with Prof. Alex Liberzon). Department of Mechanical Engineering, Tel-Aviv University.
- 2017- **Eli Barami** - Ph.D. thesis influence of rotating magnetic field on turbulence properties. (Co-supervised with Prof. Semion Sukoriansky), Department of Mechanical Engineering, Mechanical Engineering, Ben-Gurion University.
- 2015-2017 **Eli Barami** - M.Sc. thesis Enhancement of heat transfer in liquid metal target. (Co-supervised with Prof. Semion Sukoriansky), Department of Mechanical Engineering, Mechanical Engineering, Ben-Gurion University.
- 2010-2016 **Supervisor** for final projects of undergraduate and graduate students in mechanical engineering
- Final project in mechanical engineering: Strength of thin metallic foils. Ben-Gurion University.
 - Final project in mechanical engineering: Studies of heat transfer in liquid metal targets for accelerator. *Tel-Aviv University*.
 - Final project in mechanical engineering: Simulations of structural BPT experiments in thin foils. *Tel-Aviv University*.
 - Supervision for Master degree: Simulations of jet impingement for the purpose of cooling targets which exposed to high heat fluxes.

Prizes and Awards

- 2016 Management Excellent. Award by the head of IAEC.
- 2016 Excellent of Civil Service Commission.
- 2015 Excellent of SNRC. Award by the head of SNRC.
- 2013,2015 Employee Excellent.
- 2013 Excellent of SARAF accelerator department SNRC.
- 2012 Academic excellence, faculty of engineering, Tel-Aviv University.
- 2011 Kazir fellowship for excellent scientists in governmental institutes by Israeli government.
- 2003-2005 President's Award, Technion institute, 3 semesters. Dean's Award, Technion institute, 1 semester.