

Dr. Alon Osovizky - Curriculum Vitae

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Personal Details

Date and Place of birth: May 28th, 1965, Beer Sheva, Israel
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Marital Status: Married, three children
Citizenship: Israeli
Military rank: Lieutenant Colonel

Employment History

Current Position

- ❖ Since 2016: Manager, Electronics R&D department, Electronic and Control Laboratories Nuclear Research Center Negev (NRCN)
- ❖ Since 2015: CTO, Health Physics Instrumentation, Rotem Industries Ltd

Previous Positions

- ❖ 2013–2015: Research fellow at NIST Center for Neutron Research (NCNR). Developing a scintillation based neutron detector as a novel alternative to ³H counter tube.
- ❖ 2006-2013: R&D Manager, Health Physics Instrumentation, Rotem Industries Ltd and head of the radiation detection field at NRCN
- ❖ 2004-2006: Fellow researcher at Center for Addiction and Mental Health (CAMH), Toronto, Canada. The research was conducted as part of my Ph.D. studies and focused on:
 - Measurement of low activity levels of PET tracers
 - Monitoring of the cyclotron target during bombardment and isotope production
- ❖ 2000-2004: Senior R&D engineer of detection systems, Project Manager and Team Leader
- ❖ 1995-2000: Junior electronic engineer - development of health physics instrumentation

Professional Activity and Expertise

- ❖ Managing the R&D of radiation detection systems for Health Physics Instrumentation, Medical Imaging, Industrial Applications and Homeland Security (HLS) special requirements.
- ❖ Expert consultant for Alpha, Beta, Gamma and Neutron radiation detection.
- ❖ Professional guidance of research and development teams
- ❖ Active participation in the International Electrotechnical Commission (IEC) 45B workgroup, formulating standards for HLS instrumentation and area radiation monitoring systems.
- ❖ The Israeli delegate for IAEA professional working committees
- ❖ Leading of large scale technological projects including the literature surveys, feasibility studies, development phases and the performance of the validation stage.
- ❖ Academic guidance for Postgraduate studies
- ❖ Germination of novel technological collaborations between industry and academia
- ❖ Preparation and submission of international research proposals
- ❖ R&D of radiation sensors for Taylor-made solutions
- ❖ Evaluation of the detection alternatives and configuring the system design
- ❖ Initiation of technological and scientific projects
- ❖ Integration of advanced detection technologies into customized solutions
- ❖ Project management including the definition of the project's specifications, working plan, timetable and resources
- ❖ Carrying out experimental studies, modeling, and final Q.A testing
- ❖ Supervision of electronic circuit design and instrument construction
- ❖ Coupling optimization between advanced scintillation crystals and light sensors
- ❖ Growth of novel detection methods
- ❖ Electronic development of pre-amplifiers for solid-state based sensors
- ❖ Definition and development of software user interface and requisite algorithms
- ❖ Monitoring the operation of newly-developed systems for performance upgrade and amplification
- ❖ Technical documentation, scientific publications and patents application
- ❖ Promotion of marketability for mature products and characterization of the market requirements for the development of new detection technologies and products

Education

- 2003 - 2009 **Ph.D** Department of Nuclear Engineering, Ben-Gurion University of the Negev, Beer Sheva, Israel.
- Topic: "Optimizing Radiation Detector Systems for Data Acquisition and Quality Control in Positron Emission Tomography"***
- Supervisors: Prof. Brenda Laster (BGU) & Prof. Sylvain Houle, University of Toronto (UOT), Toronto, Canada.
- A Joint collaboration with the PET center at the Center for Addiction and Mental Health (CAMH), UOT and BGU
- 1995-1998 **M.B.A** School of Industrial Engineering and Management, Ben-Gurion University of the Negev, Beer Sheva, Israel.
- Master of Business Administration, specializing in Project Management.
- 1992 - 1994 **M.Sc.** Department of Nuclear Engineering, Ben-Gurion University of the Negev (BGU), Beer Sheva, Israel.
- Topic: "Kinetics of Hydrogen Absorption in Massive Samples of the Intermetallic Compound, LaNi₅"***, Thesis grade 95
- Supervisor Prof. Yizhak Jaco
- Industry Scholarship Studies
- 1988 - 1992 **B.Sc.** Department of Electronics and Computers Engineering, Ben-Gurion University of the Negev, Beer Sheva, Israel.
- Topic: "Three Stage Magnetic Pulse Compression for Laser Production"***, Project grade 95
- Supervisor Prof. Raul Rabinovici
- Collaboration with the industry

Topics of Scientific Activity

Herein is a list of my research fields and activities followed by main publications:

Detection instrumentation

- SENTIRAD—An innovative personal radiation detector based on a scintillation detector and a silicon photomultiplier, [doi:10.1016/j.nima.2011.01.027](https://doi.org/10.1016/j.nima.2011.01.027)
- New Radiation Sensor Embedded in a Metal Detection Unit, [doi: 10.1109/TNS.2009.2039580](https://doi.org/10.1109/TNS.2009.2039580)
- Telepole – GM meter on an Extendible Pole, [Available from INIS 29045664](#)
- Pin Diode Detector for Radiation Field Monitoring in a Current Mode, [Available from INIS 31049532](#)

Electronic design and Simulation

- Sub-milliwatt spectroscopic personal radiation device based on a silicon photomultiplier, [doi:10.1016/j.nima.2010.08.062](https://doi.org/10.1016/j.nima.2010.08.062)
- Optimization of ⁶LiF:ZnS(Ag) Scintillator Light Yield Using Geant4
- Computational Techniques for Optimizing Performance of a LiF:ZnS(Ag) Neutron Detector using Recorded Waveforms

Isotope Identification

- Synthetic software γ -ray spectra generation of SNM masking scenarios for homeland security application, [doi:10.1117/12.862462](https://doi.org/10.1117/12.862462)
- A Novel Personal Radiation Detection and Identification Device, [doi: 10.1109/NSSMIC.2009.5401852](https://doi.org/10.1109/NSSMIC.2009.5401852)
- Synthetic Gamma-ray Spectra for HLS Radio-Nuclides Analysis, [doi: 10.1109/NSSMIC.2009.5401630](https://doi.org/10.1109/NSSMIC.2009.5401630)

Nuclear Medicine

- New detection configuration for low activity levels of PET tracers during the analysis of plasma samples, <https://www.sciencedirect.com/science/article/pii/S0969804318308273>
- Radiation levels in cyclotron-radiochemistry facility measured by a novel comprehensive computerized monitoring system, [doi:10.1016/S0168-9002\(98\)01407-7](https://doi.org/10.1016/S0168-9002(98)01407-7)
- A new approach for an HPLC metabolite radiation detection system which increases sensitivity and optimizes data acquisition, [1537](#)
- Cyclotron Target Monitoring During Bombardment for PET Isotope Production, [Available from INIS 40014150](#)
- Methods for Determining the Activity Concentration Calibration Factor for Ventilation Duct in Cyclotron Sites, [Available from INIS 40014092](#)

SiPM - light sensor technology

- Optimizing the design of a silicon photomultiplier-based radiation detector, [doi:10.1016/j.nima.2011.01.022](https://doi.org/10.1016/j.nima.2011.01.022)

- Silicon photomultiplier and radiation detection: follow-up study and the path forward, [doi:10.1117/12.862301](https://doi.org/10.1117/12.862301)
- Selection of silicon photomultipliers for a ${}^6\text{LiF:ZnS(Ag)}$ scintillator based neutron detector, <https://iopscience.iop.org/article/10.1088/2399-6528/aab381>
- Development of a Thin, Double-Sided Alpha/Beta Detector for Surface-Contamination Measurements, <https://ieeexplore.ieee.org/document/7425269>

New algorithm

- Improving the Detecting Performances of Radiation Portal Monitors Using Matched Filter Algorithm And Generalized Likelihood Ratio Test, [doi: 10.1109/NSSMIC.2009.5401563](https://doi.org/10.1109/NSSMIC.2009.5401563)
- Compensation of Scintillation Sensor Gain Variation During Temperature Transient Condition Using Signal Processing Techniques, [doi: 10.1109/NSSMIC.2009.5402169](https://doi.org/10.1109/NSSMIC.2009.5402169)
- Improving Activity Estimation in Passive Gamma Scanning for Radioactive Waste Drums
- Estimation of the Radiation Source Direction based Segmented Cubic Detector Configuration

Homeland Security












- Decreasing the Minimum Detectable Level of an Advanced Spectroscopic Portal by Using Multiple Detector Approach, [doi: 10.1109/NSSMIC.2008.4775219](https://doi.org/10.1109/NSSMIC.2008.4775219)
- Development of Gamma and Neutron Personal Radiation Detector, Available from INIS 38093066
- Radioactive Material Detection System (RMDS) Based on Advanced Spectroscopic Portal Technology, Available from INIS 40014152
- An Integrated Approach For Multi Purpose Fast Deployment Environmental Radiation Monitoring System, [doi: 10.1109/NSSMIC.2009.5401561](https://doi.org/10.1109/NSSMIC.2009.5401561)
- Improving the radiation detection level and operational data of pre and post event monitoring systems <https://www.iaea.org/publications/12238/international-conference-on-nuclear-security-commitments-and-actions>

Neutron Detection

- An energy analyzing detector for cold neutrons, [doi: 10.1109/NSSMIC.2008.4775219](https://doi.org/10.1109/NSSMIC.2008.4775219)
- Design of a New Cold Neutron Detector, [doi: 10.1109/NSSMIC.2008.4775219](https://doi.org/10.1109/NSSMIC.2008.4775219)
- Decreasing the Minimum Detectable Level of an Advanced Spectroscopic Portal by Using Multiple Detector Approach, [doi: 10.1109/NSSMIC.2008.4775219](https://doi.org/10.1109/NSSMIC.2008.4775219)
- ${}^6\text{LiF:ZnS(Ag)}$ Mixture Optimization for a Miniature Highly Efficient Cold Neutron Detector, <https://www.nist.gov/publications/6lifznsag-mixture-optimization-miniature-highly-efficient-cold-neutron-detector>

Main Developments

The following table represents worldwide commercial implementations based on my R&D.

<u>Device</u>	<u>Main purpose</u>	<u>Picture</u>	<u>link</u>
PDS GO	A lightweight, small, sensitive, personal gamma radiation detector, designed to meet the ANSI N42.32 & 42.33 radiation detection requirements		file:///C:/Users/WIN10/Downloads/PDS-GO_Rotem_09052017.pdf
DRMID	A highly stable and accurate dose rate meter with sophisticated software offering special features and optimal performance for telemetry data.		file:///C:/Users/WIN10/Downloads/DRM-ID%20(1).pdf
RAM ION	A portable ion chamber survey meter designed for highly stable and accurate measurement of dose rates and integrated dose of gamma, x-ray and beta radiation.		file:///C:/Users/WIN10/Downloads/RAM-ION-18112018.pdf
PDS-100GN/ID	A Spectrometric Personal Radiation Detector for the detection of nuclear material, with high sensitivity, fast response and embedded spectra acquisition		file:///C:/Users/WIN10/Downloads/PDS-100GN-ID.pdf
AMP-100	High-range waterproof area monitoring instrument designed specifically to be used in high dose rate fields		file:///C:/Users/WIN10/Downloads/AMP-100.pdf
TELEPOLE	A wide range telescopic survey meter designed to obtain readings in a wide range of fields		http://www.radiotech.it/Data/Sites/1/media/documents/products/TelePole.pdf
Medi-Smarts	A comprehensive radiation monitoring system for cyclotron facilities and accelerators. The most respected and used monitoring system available today (over 260 installed systems worldwide)		https://www.rotem-radiation.co.il/products/med/
RMDS	Advance Spectroscopic Radiation Detection Portal used for complete vehicle/ pedestrian detection of unknown hidden radioactive moving sources		https://www.rotem-radiation.co.il/wp-content/uploads/RMDS.pdf
RAD-ION RI-02	Smart survey meter for accurate rate & dose measurements and programmable modes for alerting the user to posting and transportation survey requirements		https://www.rotem-radiation.co.il/wp-content/uploads/RAD-ION_RI-02_08012017.pdf
FDG Module	For measuring the 511keV emitters activity during the production in radiochemistry laboratories		https://www.rotem-radiation.co.il/wp-content/uploads/2016/06/MediSmarts-FDG-module.pdf
RAM 511	Continuous air monitoring sampler for extremely low concentration levels required by laboratories producing PET isotopes		https://www.rotem-radiation.co.il/wp-content/uploads/2016/06/RAM511-AirSamplerforPositronEmitters.pdf

Grants:

- Government Fund - Development of Detection Technology 2006-2019
- Government Fund - Development of Novel Detector 2008-2011
- Government Fund – development of Scintillation technology 2009-2010
- Pazi Research Fund – Development of Detection Technologies 2018-2020
- Pazi Research Fund - Infrastructure for Detection Lab 2018-2020
- Israel Space Agency - Development of Detection Technologies 2019-2021
- Israeli Ministry of Science – Development of Nanoparticles based Detector 2010-2021

References:

Dr. Radoslav Radev	International Electrotechnical Commission SubCommittee 45B Chairman Radev1@llnl.gov	1-925-422-3044
Prof. Ehud Behar	Technion, Head of the Department of Physics behar@physics.technion.ac.il	972-4-829-5561
Prof. Brenda Laster	BenGurionUniversity of the Negev Israel Department of Nuclear Engineering blaaster@bgumail.bgu.ac.il	972-8-646-1317
Prof. Sylvain Houle	Director, CAMH PET Center and Toronto University sylvain.houle@camhpet.ca	1-416-979-4651
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Dr. Nicholas C. Maliszewskyj	Leader, Data Acquisition and Electronics Group, NIST Center for Neutron Research nicholas.maliszewskyj@nist.gov	1-301-975-3171