Date: 1.6.2020

**R E S U M E**

**1. PERSONAL DETAILS**

Full name: Aharon Blank

Identity No. 029099330

Date and place of birth: 15.3.1972 - Israel

Marital status: Married+3

Web site: http://mr-lab.technion.ac.il/

**2. ACADEMIC DEGREES**

01/07/1997-09/12/2002: Ph.D. in Physical Chemistry at the Hebrew University of Jerusalem.

*Subject*: The Application of Electron Spin Polarization in Advanced Materials to Novel Electromagnetic and Electro-Optic Devices.

*Supervisor*: The late Prof. Haim Levanon, The Hebrew university of Jerusalem, Department of Physical Chemistry.

*Summa cum laude.*

01/10/1992-18/05/1997: M.Sc, Tel-Aviv University, Electrical-Engineering, Department of Physical Electronics and Applied Physics.

*Subject:* Emission-Absorption of microwave radiation using paramagnetic resonance spectroscopy. Examination of its Applications for Systems Deviating From Thermal Equilibrium.

*Supervisors*: Prof. Rafael Kastner, Tel-Aviv University Electrical-Engineering and Prof. Haim Levanon, The Hebrew university of Jerusalem, Department of Physical Chemistry.

*Final grade: 93.3, thesis grade: 100.*

01/10/1989-01/10/1992: B.Sc. The Hebrew University of Jerusalem in Physics, Mathematics and Chemistry.

*Cum laude.*

**3. ACADEMIC APPOINTMENTS**

1/7/2019 – present: Full Professor at the Schulich Faculty of Chemistry, Technion Israel Institute of Technology, Israel.

1/1/2012 – 1/7/2019 : Associate Professor at the Schulich Faculty of Chemistry, Technion Israel Institute of Technology, Israel.

1/10/2005 – 31/12/2011:Senior Lecturer at the Schulich Faculty of Chemistry, Technion Israel Institute of Technology, Israel.

13/09/2002- 12/9/2005: Post Doc researcher at Cornell University, NY, USA. Work on ESR microscopy.

**4. PROFESSIONAL EXPERIENCE**

01/10/1999- 28/11/2008: Researcher at TopSpin Medical (Israel), a medical device company. In charge of research and development of the first and smallest self-contained Magnetic Resonance Imaging (MRI) probe for intravascular applications. This 1.73 mm diameter probe is operated through a catheter for the diagnosis of heart disease and is undergoing clinical human tests. The scope of my position (and the hours spent every month) in this company varied from chief scientist, to Chief Technical Officer (CTO), and later served as a consultant to this company.

09/07/1989-08/03/1998: Military service, first as a cadet (3.5 years) and then as a professional Israel Air Force (IAF) officer involved in the research of electromagnetic waves propagation, antennas, radar, and microwave devices. Some of the research was performed in the IAF headquarters (3 years) and some in the Israeli aerospace industry (Israel Aircraft Industries – 1.5 years, and RAFAEL – 1 year).

**5. RESEARCH INTERESTS**

My line of work is in the field of magnetic resonance, mainly Electron Spin Resonance (ESR) and Nuclear Magnetic Resonance (NMR).

Magnetic resonance is one of the most versatile fields of science, with applications ranging from chemical structure determination to medical imaging, and quantum information processing. Consequently, this technique is fairly multidisciplinary, and involves researchers from all aspects of natural and life sciences, and engineering. From a scientific point of view, magnetic resonance was, up to date, the main focus of at least seven Nobel prizes in physics, chemistry, and medicine. From an industrial point of view, magnetic resonance is a multibillion industry, aiming at a wide range of medical and chemical applications.

Despite the fact that magnetic resonance was discovered over 60 years ago, and magnetic resonance imaging is more than 30 years old, there is still “plenty of room down there” for new methodologies, approaches, and applications. For example, magnetic resonance is known to be very insensitive technique that requires relatively large amounts of material for spectroscopic evaluation. We are trying to resolve this drawback through the use of new types of detection methods. Namely, we develop sensitive miniature ESR resonators that operate at wide range of temperatures and frequencies. From another aspect, magnetic resonance imaging has currently limited spatial resolution in the order of several microns. Currently we already achieved sub-micron scale resolution with ESR imaging, and we are looking into methods and means to improve the resolution to the deep sub-micron level at low temperatures and high magnetic fields. This is carried out either by using conventional “induction detection” approaches, or by newly developed optical and electrical detection methods, which we combine with magnetic resonance imaging protocols. Yet another area of enormous potential, which is currently still at its infancy, is in the field of quantum information processing (or quantum computers). Here magnetic resonance was used successfully to demonstrate various quantum data processing algorithms, but only with a few quantum bits. We are looking into methods to greatly enhance this capability and to enable the realization of a practical magnetic resonance quantum computer with ultra-sensitive ESR. In the field of NMR and ESR, we are developing techniques for “*ex-situ*” magnetic resonance, where the sample is located outside the magnet. This is very useful for materials science and medical applications.

**6. TEACHING EXPERIENCE**

1. Laboratory in Analytical Chemistry 1 – undergraduate level.
2. Laboratory in Analytical Chemistry 2 – undergraduate level.
3. Analytical Chemistry for Engineers - undergraduate level.
4. Analytical Chemistry for Chemists 2 - undergraduate level.
5. Chemical Kinetics - undergraduate level.
6. General Chemistry - undergraduate level.
7. Physical Chemistry for Physicists - undergraduate level
8. Physical Chemistry for Medical Sciences – Undergraduate level
9. Physical Chemistry for Biological Sciences – Undergraduate level

*New courses prepared for undergrad and graduate level students*

1. Advanced methods in Physical Chemistry - undergraduate +graduate level course.
2. Advanced experimental methods in magnetic resonance - graduate level course.

**7. TECHNION ACTIVITIES**

1. 2006: Technion committee for purchasing and budgetary issues in the SAP.
2. 2014-2016: Member of the Technion Faculty Association (Union) oversight committee.
3. 2017 - 2019: Head of the Technion Faculty Association (Union) oversight committee.
4. 2020 - : Member of the Technion Faculty Association (Union)

**8. DEPARTMENTAL ACTIVITIES**

1. 2009-2012: In charge of the Faculty web site.
2. 2012-2016: Head of the physical chemistry section at the faculty of chemistry.
3. 2010- : In charge of the technical services (machine shop and electronics service) at the faculty
4. 2017- : Head of the faculty-students committee.

**9. PUBLIC PROFESSIONAL ACTIVITIES**

1. 2008: Guest editor of a special issue in the Israel Journal of Chemistry (with Prof. Kuppusamy).
2. 2009: Co-organizer of the international DNP summer school (held in Safed, Israel, Oct. 2009).
3. 2013: Member of the ISF grant evaluation panel, Biophysics & soft condensed matter - No. 11.8
4. 2013; Co-organizer of the 6th advanced EPR school of the European Federation of EPR groups (held at the Weizmann Institute of Science, Israel, Jan 2013).
5. 2014 – present: **Secretary - International EPR)ESR( Society**
6. 2014: Member of the ISF grant evaluation panel, Physical Chemistry - No. 12.5
7. 2015: PhD exam committee, Mr Gabriele Gualco , EPFL, Lausanne.
8. 2017: Member of the ISF grant evaluation panel, CIRP - Collaborative Research Grant - No. 90.2
9. 2018: Member of the BSF grant evaluation panel, biomedical engineering section.
10. 2018: Member of the RBNI “Nevet” grant evaluation committee.
11. 2018 Guest editor of a special issue in the Applied Magnetic Resonance, hounding Jack Freed 80th Birthday (with Prof. Saxena).
12. Reviewed more than 60 papers for Nature, Nature communication, Journal of Magnetic Resonance, Journal of Physical Chemistry, Journal of Physical Chemistry Letters, Biophysical Journal, Applied Magnetic Resonance, Review of Scientific Instruments, Quantum Information Processing, Journal of Materials Science.
13. Reviewed more than 20 grant applications for the ISF, BSF, ERC, DFG, Pazy, and GIF.

**10. MEMBERSHIP IN PROFESSIONAL SOCIETIES**

1. 2005- present, member Israel Chemical Society
2. 2010- 2015, member Biophysical Society
3. 2008- present, member International EPR (ESR) Society
4. 2013- present, member Groupement Ampere
5. 2017- present, member International Society for Magnetic Resonance (ISMAR)

**11. FELLOWSHIPS, AWARDS AND HONORS**

1. 2018: Hilda and Hershel Rich Technion Innovation Award (5 k$ prize shared with my student – Itai Katz).
2. 2007: Selected among the first 200 grantees of the first ERC (European Research Council) starting research grant for young investigators (in all fields of natural and social sciences).
3. 2006: Prof. E.D Bergmann Memorial, Award (Awarded by the United States – Israel Binational Foundation)
4. 2005: The Yigal Alon Fellowship (Award by the Council for Higher Education in Israel).
5. 2004: Career Development Chair from the Technion. (Unique chair position to assist in the recruitment of new scientists).
6. 2003: Max Slomiuk prize for Ph.D. thesis (prize granted by the Hebrew University for excellent PhD thesis, 2k$).
7. 2002: Rothschild post-doctoralfellowship (a personal post doc fellowship granted by the Rothschild foundation to the Top PhD graduate in Israel, 40 k$ for 1 year).
8. 2001-2002: Faye Kaufman prize in excellence from the Canadian friends of the Hebrew University (two years personal fellowship of ~ 20 k$ per year).
9. 2001: One of the best 12 papers for year 2000 in Spectrochimica Acta (publication # 2 in my list).
10. 1998-2000: Eshkol Ph.D. Fellowship from the Israeli Ministry of Science (three years personal fellowship of ~ 20 k$ per year).

**12. GRADUATE STUDENTS**

**Completed PhD Theses**

1. Revital Halevy (Herman) – PhD. 2005-2010, “Mapping of Oxygen Concentration in Biological Samples by Electron Spin Resonance Microscopy”. Primary supervisor: A. Blank. Was employed at Analytical Chemistry R&D in Adama – Agan.
2. Katrin Suhovoy (Dikarov) – PhD, 2010 –2016 “Solar Cells Study using Advanced Electron Spin Resonance Techniques”. Primary supervisor: A. Blank. Works as instructor in the student teaching labs in physics, Technion.
3. Itai Katz – PhD. Chemistry, 2013-2018 “New Approaches for Improving the Sensitivity of Magnetic Resonance Imaging”. Primary supervisor: A. Blank. Now doing Post Doc at HUJI.

**Completed MSc Theses**

1. Yael Talmon – MSc. Chemistry, 2006-2010, “Electron Spin Resonance applied to the observation of diffusion processes". Primary supervisor: A. Blank. Works as a researcher in TEVA.
2. Katrin Suhovoy – MSc. Physics, 2006 – 2010, “Pulsed Electron Spin Resonance Imaging study of paramagnetic centers in the solid phase”. Primary supervisor (only for formal matters): A. Keren (Physics). Additional supervisor: A. Blank. Works as instructor in the student teaching labs in physics, Technion.
3. Itai Katz – MSc. Chemistry, 2008 –2012 "Earth field NMR with chemical shift spectral resolution”. Primary supervisor: A. Blank. Works at the Institute for Biomathematics as a researcher.
4. Imri Kissos – MSc. Electrical Engineering, 2010-2013 “Statistical reconstruction algorithms for CW ESR imaging”. Primary supervisor: A. Feuer (EE). Additional supervisor: A. Blank. Works in Applied Materials
5. Ksenia Sirota – MSc. Biomedical engineering, 2010-2013 “Probe for ESR Biodosimetry of the tooth”. Primary supervisor (only for formal matters): H. Azhari (Biomedical engineering). Additional supervisor: A. Blank. Works in Tower Semiconductors.
6. Mada Hashem – MSc. Chemistry, 2013-2015 "Biological Applications of Electron Spin Resonance with High Spatial Resolution". Primary supervisor: A. Blank. PhD student in Canada.
7. Helen Wolfson – MSc. Biomedical engineering, 2013-2015 "Pulsed Electron Spin Resonance Miniature Sensors for Tooth Biodosimetry and Oxymetry". Primary supervisor: A. Blank. Works at Webster Biosense.
8. Anton Sorkin – MSc project. Electrical engineering, 2013-2015 “Ultra-Sensitive miniature resonator for electron spin resonance at mm frequencies”. Primary supervisor: A. Blank. Works in RAFAEL.
9. Yaron Artzi – MSc. Physics, 2014-2016 “Advances in High Sensitivity and High Spatial Resolution Electron Spin Resonance Towards Implementation of Quantum Gate Operations”. Primary supervisor (only for formal matters): Y. Avron (Physics). Additional supervisor: A. Blank. PhD Student.

**PhD Theses in Progress**

1. Yakir Ishay– PhD. Chemistry, 2015-2019 (exp) “Design of Novel Micro Resonators Structures for Ultra-Sensitive Electron Spin Resonance”. Primary supervisor: A. Blank.
2. Lotem Buchvinder – PhD. Chemistry, 2015-2019(exp) “Advanced Electron Spin Resonance in Tooth Enamel for Retrospective Dosimetry”. Primary supervisor: A. Blank.
3. Yaron Artzi – PhD, 2016-2020(exp). Primary supervisor: A. Blank.
4. Nir Dayan – PhD, 2017-2021(exp). Primary supervisor: A. Blank.
5. Alex Sherman – PhD, 2017-2021(exp). Primary supervisor: A. Blank.

**MSc Theses in Progress**

1. Yoni Zimmermann – MSc, Physics 2017-2019 (exp). Primary supervisor: David Gershoni, secondary supervisor: A. Blank.

**13. SPONSORED LONG-TERM VISITORS AND POST-DOCTORAL ASSOCIATES**

1. Dr. Vishal Misra (from India) – 1.7.2009-1.3.2010
2. Dr. Nasim Warwar (from Hebrew University, Jerusalem) – 1.11.2009-1.11-2011
3. Dr. David Cristea (from Rumania) - 1.8.2014 – 1.8.2016.

**14. RESEARCH GRANTS**

**Competitive**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| From-To | Title of project | Sources | PIs | Total grant |
| 1.2006-1.2007 | Ex-Situ Spectroscopic NMR | German Israeli Foundation – Young Scientists | Aharon Blank | ~50k$ |
| 10.2005-10.2009 | Electron Spin Resonance Microscopy for Biological Applications | Israel Science Foundation | Aharon Blank | 190k$ for equipment +180k$ |
| 10.2005-10.2008 | Electron Spin Resonance Spectroscopy approaching Single Spin Sensitivity and Deep Sub-Micron Resolution | Israel Science Foundation – Bikura Program | Aharon Blank and Arie Ruzin | 30k$ for equipment +135k$ |
| 6.2006-9.2007 | Quantum computing with endohedral fullerens on surface | RBNI nano Technology Institute | Aharon Blank and Eliezer Kolodney | 30k$ |
| 10.2006-10.2010 | Biophysical and Medical Applications of ESR Microscopy | US-Israel Binational Science Foundation | Aharon Blank and Periannan Kuppusamy | 180k$ |
| 6.2006-6.2008 | Single Sided Probe for Electron Spin Resonance Imaging of Semiconductors | Horowitz Fund | Aharon Blank | 210k$ |
| 8.2008-8.2013 | Expanding the horizons of magnetic resonance in sensitivity, imaging resolution, and availability - The MR Challenge | European Research Council | Aharon Blank | 1.25 M Euro |
| 10.2009-10.2013 | Electron Spin Resonance as a Tool for Measuring Dynamics | Israel Science Foundation | Aharon Blank | ~ 200 k$ |
| 3.2010-3.2011 | Hand-held probe for the measurement of absorbed radiation due to nuclear event | Gurwin foundation | Aharon Blank | ~ 35 k$ |
| 10.2010-10.2014 | Oxygen Sensing in Live Systems at the Micro-Scale by ESR | US-Israel Binational Science Foundation | Aharon Blank and Periannan Kuppusamy | 180k$ |
| 1.2011-12.2013 | Nanometer-scale Defect Spin Mapping in Polycrystalline Silicon Solar Cells with advanced ESR Methodologies (nano Desperado) | German Israel Foundation | Aharon Blank and Klaus Lips | ~ 195 kEuro |
| 3.2011-3.2013 | Compact Biodosimetry Probe based on ESR Signals from Incisor Teeth | NIH/ NIAID | Aharon Blank | 100 k$ |
| 3.2012-3.2013 | Electron Spin Resonance Nano-Imaging for the Analysis of Semiconductor | European Research Council | Aharon Blank | 150k Euro |
| 10.2012-9.2015 | Hand-held scanner for clinical oximetry | NIH | Aharon Blank and Periannan Kuppusamy | 135k$ |
| 10.2013-9.2017 | Electron Spin Resonance with Nonlinear Induction Detection at Cryogenic Temperatures | Israel Science Foundation | Aharon Blank | 240k$ |
| 9.2013-9.2016 | Electron Spin Resonance with Ultra-High Spin Sensitivity and nm-scale Resolution for Quantum Computation | US Air Force Office of Scientific Research | Aharon Blank and Jack Freed | ~330 k$ |
| 9.2014-8.2016 | A Portable Electron Paramagnetic Resonance Oximetry Device for Clinical Applications | Israel Ministry of Economy | Aharon Blank | ~200 k$ |
| 12.2015-12.2018 | Nondestructive chemical characterization and imaging of solid-state devices | Israel Ministry of Science | Aharon Blank | ~210 k$ |
| 6.2016-6.2018 | Miniature EPR sensor for on-site oximetry | NIH | Aharon Blank and Periannan Kuppusamy | ~130k$ |
| 7.2016-7.2018 | Amphiphilic polymeric antioxidants – a new paradigm for fast degradation of plastic pollution in water | Israel Ministry of Science | Aharon Blank and Sergey Filippov | ~60k$ |
| 1.2017-12.2019 | Electronic structure of catalytic centers based on ultra-high-sensitivity electron paramagnetic resonance of microcrystals | German-Israeli Foundation | Aharon Blank and Edward Reijerse | ~150 kEuro |
| 10.2017-10.2021 | A new approach for long distance measurements in large macromolecules and molecular complexes | Israel Science Foundation | Aharon Blank | 240k$ |
| 6.2017-5.2022 | National Biomedical Center for Advanced ESR Technology (ACERT) | NIH | Jack Freed and Aharon Blank (collab.) | 325k$ |
| 1.2018-6.2021 | Advanced Electron Spin Resonance Methodologies Applied to Tooth Enamel-Based Retrospective Dosimetry | PAZY fund | Aharon Blank | ~120 k$ |
| 6.2018-5.2019 | Novel approaches for scalable spin-based quantum computing and sensing | Schmidt Sciences Nascent Innovative Research Grants | Aharon Blank | 186 k$ |
| 1.2018-9.2021 | Advanced Electron Spin Resonance Methodologies Applied to Tooth Enamel-Based Retrospective Dosimetry | PAZY fund (major equipment grant) | Aharon Blank and Hana Datz | 1.45 M NIS |
| 7.2018-6.2019 | Cancer Diagnosis by MRI of Glucose | Israel Ministry of Economy | Aharon Blank, Daniella Goldfarb and Rachel Katz-Brull | ~183 k$ |
| 7.2019-6.2020 | Cancer Diagnosis by MRI of Glucose | Israel Ministry of Economy | Aharon Blank, Daniella Goldfarb and Lucio Frydman | ~183 k$ |
| 11.2019-10.2020 | Quantum amplifier for photons at microwave | Israel Ministry of Economy | Aharon Blank, with IAI-ELTA | ~150 k$ |
| 5.2020 - 4.2020 | Simple and affordable magnetic resonance instrumentation for finding the structure of viruses | Israel Ministry of Economy (Kamin Corona) | Aharon Blank | ~120 k$ |
| 10.2020-9.2024 | A personalized 3D oxygen-sensing skin graft for the diagnosis and treatment of chronic wounds in patients with diabetes | ISF (Personalized Medicine) | Aharon Blank with Marcelle Machluf, Yaron Fuchs and Mogher Khamaisi | ~1.2 M$ |

**Industrial and other sources**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9.2006-2.2008 | Prototype probe for MRI of prostate cancer | TopSpin Medical | Aharon Blank | 110 k$ |

**15. PUBLICATIONS**

**Theses**

1. MSc Thesis: Blank, A. “Emission-Absorption of microwave radiation using paramagnetic resonance spectroscopy. Examination of its Applications for Systems Deviating From Thermal Equilibrium”. Tel Aviv, 1998.
2. PhD Thesis: Blank, A. “The Application of Electron Spin Polarization in Advanced Materials to Novel Electromagnetic and Electro-Optic Devices”. Jerusalem, 2002.

**Refereed papers in professional journals**

1. **Blank A**., Kastner R., and Levanon H., “Exploring New Active Materials for Low-Noise Room Temperature Microwave Amplifiers and Other Devices," *IEEE Transaction on Microwave Theory and Techniques*, **46** (1998) 2137-2144. (IF - 2.89, citations - 24).
2. **Blank A.**, and Levanon H., "Filling Factor of a Paramagnetic Sample in a Rectangular Cavity. Theory and Application," *Spectrochimica Acta A*, **56** (2000) 363-371. (IF - 2.88, citations - 8).
3. **Blank A.**, and Levanon H., "Triplet Radical Interaction. Direct Measurement of Triplet Polarization Transfer by Fourier-Transform Electron Paramagnetic Resonance", *Journal of Physical Chemistry A* **104** (2000) 794-800. (IF - 2.83, citations - 36)
4. **Blank A.**, and Solomon S., “Power Laws in Cities Population, Financial Markets and Internet Sites (Scaling in Systems with a Variable Number of Components),” Physica A **287** (2000) 279-288. (IF - 2.13, citations - 185)
5. **Blank A.**, Galili T., and Levanon, H., "Triplet Porphyrins as Donors in Intramolecular Electron Transfer and their Intermolecular Interaction with Free Radicals", *Journal of porphyrins and phthalocyanines*, **5** (2001) 58-66. (IF - 1.39, citations - 11)
6. **Blank A.**, and Levanon H., “Interaction between Polarized Triplets and Stable Radicals in Liquid Solutions,” *Journal of Physical Chemistry A,* **105** (2001) 4799-4807. (IF - 2.83, citations - 38)
7. **Blank A.**, and Levanon H., “Applications of Photoinduced Electron Spin Polarization at Room Temperature to Microwave Technology,” *Applied Physics Letters,* **79** (2001) 1694-1696. (IF - 3.49, citations - 14)
8. **Blank A.**, and Levanon H. “Toward maser action at room temperature by triplet-radical interaction and its application to microwave technology,” *RIKEN review*, **44** (2002) 128-130. (IF - 2.1, citations - 6)
9. **Blank A.**, and Levanon H., “Filling Factor in a Pulsed electron Paramagnetic Resonance Experiment,” *Spectrochimica Acta A*, **58** (2002) 1329-1335. (IF - 2.88, citations - 10)
10. **Blank A.** and Levanon H., “Optimal Magnetization in Liquids Produced by Triplet-Doublet Interaction,” *Molecular Physics* **100** (2002) 1477-1488. (IF - 1.83, citations - 14)
11. Yamauchi S, Takahashi A, Iwasaki Y, Unno M, Ohba Y, Higuchi J, **Blank A**, and Levanon H., “The Lowest Photoexcited Triplet State of Subphthalocyanine in Solid and Fluid Environments. Time-Resolved Electron Paramagnetic Resonance Studies,” *Journal of Physical Chemistry A*, **107** (2003) 1478-1485. (IF - 2.83, citations - 25)
12. **Blank A**, Stavitski E, Levanon H, and Gubaydullin F., “Transparent Miniature Dielectric Resonator for Electron Paramagnetic Resonance Experiments,” *Review of Scientific Instruments*, **74** (2003) 2853-2859. (IF - 1.51, citations - 42)
13. **Blank A.**, Dunnam C. R., Borbat P. P., and Freed J. H., "High Resolution Electron Spin Resonance Microscopy," *Journal of Magnetic Resonance*, **165** (2003) 116-127. ***Featured on the cover of the Journal*** (IF - 2.58, citations - 75)
14. **Blank A.**, Dunnam C. R., Borbat P. P., and Freed J. H., "A 3D Electron Spin Resonance Microscope," *Review of Scientific Instruments*, **75** (2004) 3050-3061. (IF - 1.51, citations - 22)
15. **Blank A.**, Dunnam C. R., Borbat P. P., and Freed J. H, "Pulsed Three-Dimensional Electron Spin Resonance Microscopy,” *Applied Physics Letters*, **85** (2004) 5430-5432. (IF - 3.49, citations - 35)
16. Schneiderman J., Wilensky R. L., Weiss A., Samouha E., Muchnik L., Chen- Zion M., Ilovitch M., Golan E., **Blank A.**, Flugelman M., Rozenman Y., and Virmani R., “Diagnosis of Thin Fibrous Cap Atheromas by a Self-contained Intravascular Magnetic Resonance Imaging Probe in *Ex-vivo* Human Aortas and *In-situ* Coronary Arteries,” *Journal of The American College of Cardiology* **45** (2005) 1961-1969. (IF - 19.89, citations - 86)
17. **Blank A.**, and Levanon H. “Triplet Line Shape Simulation in Continuous Wave Electron Paramagnetic Wave Experiments,” *Concepts in Magnetic Resonance* **25A** (2005) 18-39. (IF - 0.68, citations - 15)
18. **BlankA.**, Alexandrowicz G., Muchnik L., Tidhar G., Schneiderman J., Virmani R., and Golan E., “Miniature Self-Contained Intravascular Magnetic Resonance (IVMI) Probe for Clinical Applications,” *Magnetic Resonance in Medicine,* **54** (2005) 105-112. (IF - 4.08, citations - 39)
19. **Blank A.**, Freed J. H., Naraharisetti P. K., Wang C. H., "Electron Spin Resonance Microscopy Applied to the Study of Controlled Drug Release," *Journal of Controlled Release*, **111** (2006) 174-184. (IF - 7.87, citations - 22)
20. **Blank A.**, Freed J. H. "ESR Microscopy and Nanaoscopy with "Induction" Detection," *Israel Journal of Chemistry*, **46** (2006) 5430-5432. (IF - 2.6, citations - 34)
21. Halevy R., Talmon Y., **Blank A.** "Photolithograpic Production of Glass Sample Holders for Improved Sensitivity and Resolution in ESR Microscopy," *Applied Magnetic Resonance*, **31** (2007) 589-596. (IF - 0.83, citations - 9)
22. Suhovoy E., and **Blank A.** "High Resolution ESR Imaging of N@C60 Radicals on Surface", *Israel Journal of Chemistry*, **48** (2008) 45-51. (IF - 2.6, citations - 8)
23. **Blank, A.**, Talmon, Y., Shklyar, M. Shtirberg, L. and Harneit, W. "Direct Measurement of Diffusion in Liquid Phase by Electron Spin Resonance", *Chemical Physics Letters*. **465** (2008) 147-152. (IF - 1.68, citations - 19)
24. Blank, A., Suhovoy, E., Halevy, R., Shtirberg, L. and Harneit, W. "ESR Imaging in Solid Phase down to Sub-Micron Resolution: Methodology and Applications", *Physical Chemistry Chemical Physics*, **11** (2009) 6689-6699. (IF - 3.9, citations - 46)
25. **Blank, A.**, Ish-Shalom, S., Shtirberg, L. and Zur, Y. "Ex-situ Endorectal Probe for Prostate Imaging," *Magnetic Resonance in Medicine*, **62** (2009) 1585-1596. (IF - 4.08, citations - 6)
26. **Blank, A.**, Halevy, R., Shklyar, M., Shtirberg, L. and Kuppusamy, P., “ESR Micro-Imaging of LiNc-BuO Crystals in PDMS: Spatial and Spectral Grain Distribution,” *Journal of Magnetic Resonance*, **203** (2010) 150-155. (IF - 2.58, citations - 10)
27. Talmon, Y., Shtirberg, L., Harneit, W., Rogozhnikova, O. U., Tormyshev, V., and **Blank, A.**, “Molecular Diffusion in Porous Media by PGSE ESR”, *Physical Chemistry Chemical Physics* **12** (2010) 5998 - 6007*.* (IF - 3.9, citations - 35)
28. Suhovoy, E., Mishra, V., Shklyar, M., Shtirberg, L., and **Blank, A.** “Direct Micro-Imaging of Point Defects in Bulk SiO2,Applied to Vacancy Diffusion and Clustering,” *European Physics Letters* **90** (2010) 26009. (IF - 1.83, citations - 7)
29. Meenakshisundaram, G., Eteshola, E. **Blank, A.**, Lee, S. C., Kuppusamy, P. “A molecular paramagnetic spin-doped biopolymeric oxygen sensor,” *Biosensors and bioelectronics* **25** (2010) 2283-9. (IF - 8.17, citations - 11)
30. Halevy, R., Tormyshev, V., and **Blank, A.**, “Micro-imaging of Oxygen Concentration near Live Photosynthetic Cells by Electron Spin Resonance,” *Biophysical Journal* **99** (2010) 971-978. (IF - 3.49, citations - 24)
31. Halevy, R., Shtirberg L., Shklyar M., **Blank A.**, “Electron Spin Resonance Micro-imaging of Live Species for Oxygen Mapping,” *Journal of Visualized Experiments (JoVE)* **42** (2010) http://www.jove.com/index/details.stp?id=2122, doi: 10.3791/2122 (IF - 1.32, citations - 5)
32. Twig, Y., Suhovoy, E., and **Blank, A.** “Sensitive Surface Loop-Gap Microresonators for Electron Spin Resonance,” *Review of Scientific Instruments* **81** (2010) 104703. (IF - 1.51, citations - 33)
33. Shtirberg, L., Twig, Y., Dikarov, E., Halevy, R., Levit, M. and **Blank, A.**, "High-Sensitivity Q-Band Electron Spin Resonance Imaging System with Sub-Micron Resolution" *Review of Scientific Instruments*, **82** (2011) 043708. ***This paper was also selected for the May 1, 2011 issue of Virtual Journal of Biological Physics Research.*** (IF - 1.51, citations - 38)
34. Shtirberg, L. and **Blank, A.**, "Short, Powerful, and Agile Current Drivers for Magnetic Resonance," *Concepts in Magnetic Resonance*, **39B** (2011) 119-127. (IF - 0.68, citations - 9)
35. Twig, Y., Suhovoy, E., Hutchison, W. D., and **Blank, A.** “Note: High Sensitivity Pulsed Electron Spin Resonance Spectroscopy with Induction Detection,” *Review of Scientific Instruments***, 82** (2011) 076105. ***This paper was also selected for the August 2011 issue of Virtual Journal of Quantum Information*** (IF - 1.51, citations - 38)
36. Warwar, N., Mor, A., Fluhr, R., Pandian, R., Kuppusamy, P., and **Blank, A.**, “Detection and Imaging of Superoxide in Roots by Electron Spin Resonance Spin Probe Method,” *Biophysical Journal* **101** (2011) 1529-1538. (IF - 3.49, citations - 16)
37. Twig, Y., Dikarov, E., and **Blank, A.**, “Cryogenic electron spin resonance microimaging probe*,” Journal of Magnetic Resonance*, **218** (2012) 22-29. (IF - 2.58, citations - 20)
38. Katz, I., Shtirberg, L., Shakour, G. and **Blank, A.** “Earth field NMR with chemical shift spectral resolution: Theory and proof of concept,” *Journal of Magnetic Resonance*, **219** (2012) 13-24. (IF - 2.58, citations - 5)
39. Raitsimring, A., Astashkin, A., Enemark, J. H., **Blank, A.**, Twig, Y., Song, Y., Meade, T. J. “Dielectric Resonator for Ka-Band Pulsed EPR Measurements at Cryogenic Temperatures: Probehead Construction and Applications,” *Applied Magnetic Resonance*, **42** (2012), 441-452. (IF - 0.83, citations - 14)
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55. **Blank, A.**, Shapiro, G., Fischer, R., London, P., and Gershoni, D., "Optically Detected Magnetic Resonance Imaging," *Applied Physics Letters* **106**, (2015) 034102. (IF - 3.49, citations - 9)
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59. Katz, I., **Blank, A.**, "Dynamic Nuclear Polarization in Solid Samples by Electrical-Discharge-Induced Radicals," *Journal of Magnetic Resonance* **261**, (2015), 95-100. (IF - 2.58, citations – 3)
60. **Blank, A.**, “Spectroscopy, Imaging, and Selective Addressing of Dark Spins at the Nanoscale with Optically-Detected Magnetic Resonance,” *Physica Status Solidi (a),* **253**, (2016), 1167–1176. (IF - 1.77, citations – 2)
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62. **Blank, A.**, “A new approach to distance measurements between two spin labels in the >10 nm range” *Physical Chemistry Chemical Physics*, **19**, (2017), 5222-5229. (IF - 3.9, citations - 4)
63. Zgadzai, O., Shtirberg, L., Artzi, Y., and **Blank, A.**, “Selective addressing and readout of optically detected electron spins,” *European Physics Letters*, **117** (2017), 1001. ***Selected as Editor’s Choice***. (IF - 1.83, citations – 0)
64. **Blank, A.**, Twig, Y., and Ishay, Y., “Recent Trends in High Spin Sensitivity Magnetic Resonance,” *Journal of Magnetic Resonance*, **280***,* (2017), 20-29. (IF - 2.58, citations – 14)
65. Ishay, Y. and **Blank, A.**, “Optimization Methods for the Design of Sensitive Surface ESR Resonators,” *Applied magnetic Resonance*, **48**, (2017), 1249–1262. (IF - 0.83, citations - 2)
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69. Dayan, N., Ishay, Y., Artzi, Y., Cristea, D., Reijerse, E., Kuppusamy, P., and **Blank, A**., “Advanced Surface Resonators for Electron Spin Resonance of Single Microcrystals,” *Review of Scientific Instruments* **89**, (2018) 124707. doi: 10.1063/1.5063367. ***Chosen as Featured Article by the Editor.*** (IF - 1.42, citations – 2)
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72. Katz, I., Feintuch, A., Carmieli, R., **Blank, A.**, “Proton polarization enhancement of up to 150 with dynamic nuclear polarization of plasma-treated glucose powder,” *Solid State Nuclear Magnetic Resonance,* 100, (2019) 26–35. (IF - 2.67, citations – 1)
73. Cristea, D., Krishtul, S., Kuppusamy, P., Baruch, L., Machluf, M., **Blank, A.**, “New Approach to Measuring Oxygen Diffusion and Consumption in Encapsulated Living Cells, based on Electron Spin Resonance Microscopy,” *Acta Biomaterialia,* 101, (2020), 384-394*.* (IF – 6.31, citations – 0).

**Review papers**

N/A

**Books**

N/A

**Chapters in books**

1. Book Chapter: Multifrequency EPR Microscopy: Experimental and Theoretical Aspects, in "Multifrequency EPR" Book by Sushil K. Misra (Editor), Wiley, 2011. ISBN: 978-3-527-40779-8.
2. Book Chapter: “EPR Microscopy”, Chapter 24, pages 521-536, in “EPR Spectroscopy: Fundamentals and Methods” Book edited by Daniella Goldfarb and Stefan Stoll Daniella Goldfarb (Editor), Stefan Stoll (Editor), Wiley, 2018, ISBN: 978-1-119-16298-8.

**Refereed papers in conference proceedings**

N/A

**Patents granted**

1. Golan E., Blank A., Alexandrowicz G. “Magnetic Resonance imaging device for operation in external static magnetic fields,” US patent 6,377,048 Apr. 2002.
2. Levanon H., Blank A., “Microwave devices based on chemically induced dynamic electron spin polarization,” US patent 6,515,539 Feb. 2003.
3. Blank A., Alexandrowicz G., and Golan E., “Magnetic Resonance Imaging Device,” US patent 6,704,594, Mar. 2004.
4. Blank A., Dunnam C. R., Borbat P. P., and Freed J. H, "Electron Spin Resonance Microscope for Imaging with micron resolution," US patent 7,403,008, July 2008.
5. Blank A., Shtirberg, L., “Probe and system for electron spin resonance imaging,” US patent 8,067,937, Nov. 2011.
6. Blank A., Katz I., "Method and Device for Ex-situ Magnetic Resonance Analysis" US Patent 8,461,836, June 2013.
7. Blank A., Twig Y., “Method and device of estimating a dose of ionizing radiation,” US Patent 8766634, July 2014.
8. Blank A, Twig Y., “System and method for electron spin resonance,” US patent 9194922, Nov. 2015.

**Research reports and other publications**

N/A

**16. CONFERENCES**

**Plenary, keynote or invited talks**

1. Blank A., and Lenanon H., “The interaction of triplets and doublets in liquid solution: Detailed mechanism and possible applications,“ The 6th Sendai Symposium on advanced EPR, Sendai Japan. Nov. 2000. (Invited talk)
2. Blank A, "Electron Spin Resonance Microscopy in Chemical Biophysics," The 72nd Meeting of the Israel Chemical Society, Tel Aviv, Israel, 6-7/2/2007. (Invited talk)
3. Blank, A, "From ESR Microscopy to ESR Nanoscopy," Gordon conference of Magnetic Resonance, Biddeford, ME, June, 2007. (Invited talk)
4. Blank, A., “Advanced Methodologies in Micro-Imaging ESR,” The 7th European Federation of EPR Groups Meeting, Antwerp, Belgium, Sep. 2009. (Invited talk)
5. Talmon, Y., Suhovoy, E., Shklyar, M., Shtirberg, L., and Blank, A., “Measurement of complex diffusion in the micro-sec time scale and 10 nm length scale by electron spin resonance,” World Wide Magnetic Resonance 2010 Florence Italy, 4-9/7/2010. (Invited talk)
6. Blank, A., “High Sensitivity Pulsed ESR Spectroscopy and Imaging applied to Solar Cells”, Workshop on Advanced EPR for material and solar energy research, Berlin, 11-13.10.2011. (Invited talk)
7. Blank, A., “Nonlinear Induction Detection of Electron Spin Resonance,” EUROMAR, Dublin, Ireland, July. 2012. (Invited talk)
8. Blank, A., “In Vivo Biological Applications of ESR Micro-Imaging,” Rocky Mountain Conference on Analytical Chemistry, Colorado, USA, July 2012. (Invited talk)
9. Blank, A., “Multifrequency sensitive miniature surface resonators for ESR – properties and applications,” SPP1601 meeting, Halle, Germany, Sep. 2012. (Invited talk)
10. Blank, A., “Spatially-resolved pulsed electrically-detected electron spin resonance”, Workshop on Spins as Functional Probes in Solar Energy Research, Berlin, 10-12.4.2013. (Invited talk)
11. Blank, A., "High sensitivity high resolution pulsed electron spin resonance in solids - technique and applications," EUROMAR, Crete, Greece, July. 2013. (Invited talk)
12. Blank, A., "High Sensitivity Spatially-Resolved Electron Spin Resonance as a New Scientific Tool, EFEPR meeting, Marseilles, France, Sep. 2014. (Plenary talk)
13. Blank, A., Shapiro, G., Fisher, R., London, P., and Gershoni, D., "ODMR imaging," SPP1601 meeting, Schwerte, Germany, Oct. 2014. (Invited talk)
14. Hashem, M., Mor, A., Kuppusamy, P., Fluhr, R., and Blank, A., "Biological Applications of High Sensitivity Electron Spin Resonance with High Spatial Resolution," APES-IES 2014 meeting, Nara, Japan, Nov. 2014. (Invited talk)
15. Blank, A, "Detection Sensitivity in Magnetic Resonance," EUROMAR 2015, Prague, July 2015. (Invited tutorial lecture).
16. Artzi, Y., Blank, A. "Induction-Detection Electron Spin Resonance With Single Spin Sensitivity," Rocky Mountain Conference on Magnetic Resonance, Snowbird Utah, July 2015. (Invited talk)
17. Blank, A. "High Sensitivity ESR with High Spatial Resolution: Methodologies and Applications," Grand Challenge Workshop, Snowbird Utah, July 2015. (Invited expert lecture).
18. Blank, A. “Compact self-contained ESR probeheads as new clinical tools,” The 49th Annual International Meeting of the ESR Spectroscopy Group of the Royal Society of Chemistry, University of Essex, 3-7 April 2016. (Invited talk).
19. Blank, A., “ESR sensitivity – current capabilities and future prospects and applications,” Asia-Pacific EPR/ESR Symposium 2016, Lake Baikal, near Irkutsk, Russia, 28 August – 2 September 2016. (Invited talk).
20. Blank, A., “A new approach for distance measurements between two spin labels in the >10 nm range,” SPP1601 meeting, Hirschegg, Austria, Oct. 2016. (Invited talk).
21. Blank, A., “Microresonators for ESR Spectroscopy of Microcrystals” Discussion Meeting: EPR and ssNMR as tools to remove the mechanisms of molecular machines, Schloss Ringberg, Germany, Dec. 2016. (Invited talk).
22. Cristea, D., Wolfson, H., Ahmad, R., Twig, Y., Kuppusamy, P., and Blank, A., “ESR in an implant” - Miniature ESR probeheads for clinical oximetry,” EPR2017 meeting, Morgantown, WV, USA, July 2017. (Invited talk).
23. Blank, A., “Three Dimensional Sub-Micron-Scale Optically-Detected ESR Imaging with Selective Spin Addressing,” QDiamond 2018 - International Workshop on Quantum Information using NV Centers in Diamond, Tel Aviv, April 2018. (Invited talk).
24. Blank, A., “Microresonators in ESR – What are they good for?” The third joint conference of the Asia-Pacific EPR/ESR Society and The International EPR (ESR) Society (IES), the University of Queensland, Brisbane, Australia, September 2018. (Invited talk).
25. Blank, A., “Oxygen diffusion in microencapsulated live cells, studied by electron spin resonance microscopy, Rocky Mountain Conference on EPR, Denver, July 2019. (Invited talk).
26. Blank, A., Dayan, N., Cristea, D., Ishay, Y. and Artzi, Y., “ESR microfluidics with picoliter samples,” EUROISMAR 2019, Berlin, August, 2019. (Invited Talk). (Invited talk).
27. Blank, A., Katz, I., Feintuch, A., Carmieli, R., “Dissolution dynamic nuclear polarization without solution,” Israel Chemical Society meeting, Jerusalem, February, 2020. (Invited talk).
28. Blank, A., “Clinical applications of miniaturized ESR technology,” 1st EPR-on-a-Chip meeting, Stuttgart, Germany, Mach 2020.

**Contributed Talks and Posters**

1. Blank A., and Zalevsky Z., “Applications of the Fractional Fourier Transform in Radar Imaging,” Antenna Measurement Techniques Association (AMTA) Symposium, Boston, MA, USA, 17-20/11/1997. (Talk).
2. Blank A., Levanon H., "Filling Factor of a Paramagnetic Sample in a Rectangular Cavity. Theory and Application," the joint VI International Workshop on Electron Magnetic Resonance (EMARDIS), and the IV International Seminar on Applied EPR (APPL-EPR), Sofia-Bojana, Bulgaria, 7–14/06/1999. (Talk).
3. Blank A., and Levanon H., “Radical-Triplet-Pair Interaction: Direct Measurements of Polarization Transfer and Radical Polarization by Fourier-Transform-Electron-Paramagnetic-Resonance Method,” the VI International symposium on Magnetic Field and Spin Effects in Chemistry and Related Phenomena. Emmetten, Switzerland, 21-26/08, 1999. (Talk).
4. Blank A., and Lenanon H., “Investigation of the Mechanisms Governing the Interaction between Triplets and Doublets in Liquid Solution,“ 42nd Rocky Mountain Conference on Analytical Chemistry - Broomfield, CO, USA 30/07-3/08/2000. (Talk).
5. Blank A., Levanon H., “Filling Factor in a Pulsed electron Paramagnetic Resonance Experiment,” the VIIth International Workshop on Electron Magnetic Resonance (EMARDIS), Sofia-Bojana, Bulgaria, 9–18/06/2000. (Talk).
6. Blank, A., Dunnam, C. R., Borbat P. P., and Freed, J. H., “High Resolution ESR microscopy,” 45th Rocky Mountain Conference on Analytical Chemistry - Denver, CO, USA 27-31/07/2003. (Talk).
7. Blank, A., Dunnam, C. R., Borbat P. P., and Freed, J. H., “Pulsed 3D Electron Spin Resonance Microscopy,” International Workshop on In-Vivo EPR, Dartmouth medical school, Hanover, NH, USA, 19-23/09/2004. (Talk).
8. Blank, A., Dunnam, C. R., Borbat P. P., and Freed, J. H., “Pulsed 3D Electron Spin Resonance Microscopy,” GIF (German-Israeli Foundation for Scientific Research and Development), Novel Approaches in Magnetic Resonance: Fundamentals and Applications, Dead Sea, Israel, 21-24/2/2005. (Talk).
9. Blank, A. and Freed, J. H., “Current and Future Trends in ESR Microscopy,” EPR 2005, Joint Conference of the 11th "In Vivo EPR Spectroscopy and Imaging" and the 8th "International EPR Spin Trapping" Columbus, Ohio USA. 4-8/9/2005. (Talk).
10. Blank, A. “Miniature Self-Contained Intravascular Magnetic Resonance Imaging (IVMRI) Probe for Clinical Applications,” 5th colloquium on mobile NMR, 21-23/9/2005, Perugia, Italy. (Talk).
11. Blank, A., Freed, J. H., "ESR Microcopy of Biodegradable Microspheres," International Conference of Magnetic Resonance in Biological Systems, 20-25/8/2006, Gottingen, Germany. (Talk).
12. Blank, A, "From ESR Microscopy to ESR Nanoscopy," Gordon conference of Magnetic Resonance, Biddeford, ME, June, 2007. (Talk).
13. Blank, A., Talmon, Y., Shklyar, M., Shtirberg, L. "Direct Measurement of Diffusion in Liquid Phase by Electron Spin Resonance", International Conference of Magnetic Resonance in Biological Systems, 24-29/8/2008, San Diego, USA. (Talk).
14. Blank, A., "The Benefits of High Sensitivity Electron Spin Resonance with fast and Strong gradients: Micro-Imaging and Dynamics," Gordon conference of Magnetic Resonance, Biddeford, ME, June, 2009. (Talk).
15. Blank, A., “Advanced Methodologies in Micro-imaging Electron Spin Resonance” 11th International Workshop on Electron Magnetic Resonance of Disordered Systems (EMARDIS) Sofia, Bulgaria, 11-18/6/2009. (Talk).
16. Halevy, R., Tormyshev, V. and Blank, A., “Micro-imaging of Oxygen Concentration near Live Photosynthetic Cells by Electron Spin Resonance,” EPR 2010 A Joint Conference of the 14th In Vivo ESR/EPR Spectroscopy & Imaging and the 11th International EPR Spin Trapping/Spin Labeling, San Juan, Puerto Rico, 2-6/5/2010. (Talk).
17. Tormyshev, V.M., Yu, O. R., Troitskaya,T. I., Trukhin,D. V., Blank A.,Rawal, V. H., and Halpern, H. J., “Persistent Deuterated Narrow-line Trityl Spin Probes for High Resolution  *in vivo* EPR 3D Oxymetric Imaging,” Current Topics in Organic Chemistry, Novosibirsk, Russia, June 2011. (Talk).
18. Twig, Y., Dikarov, E., and Blank, A., "High Sensitivity Pulsed Electron Spin Resonance Spectroscopy with Induction Detection," EUROMAR, Frankfurt, Germany, Aug. 2011. (Talk).
19. Blank, A., "High Resolution Microimaging with Pulsed Electrically-Detected Magnetic Resonance," The 47th Annual International Meeting of the ESR Spectroscopy Group of the Royal Society of Chemistry, Dundee 6-10 April 2014. (Talk).
20. Dikarov, E., Zgadzai, O., and Blank., A., “Direct measurement of the flip-flop rate of electron spins in solid-state,” The Xth Conference of the European Federation of EPR groups (EFEPR), Torino (Italy), September 2016. (Talk).
21. Blank, A., Zgadzai, O., Shtirberg, L., and Artzi, Y., “Selective Addressing and Readout of Optically Detected Electron Spins,” International Society of Magnetic Resonance Meeting 2017, Quebec, Canada, July 2017. (Poster).
22. Blank, A., Katz, I., Feintuch, A., Carmieli, R., “Dissolution dynamic nuclear polarization without solution,” XIth EFEPR Conference, Bratislava, September 2019. (Poster).

**Participation in organizing conferences**

1. Annual meeting of the Israeli club for magnetic resonance, Technion, May 15th, 2007 Organization function: Co-organizer and Co-chair (with Prof. Asher Schmidt).
2. Member of the Scientific Committee of the 8th European Federation of EPR Groups Meeting, Frankfurt, August 2011.
3. Annual meeting of the Israeli club for magnetic resonance, Technion, June 12th, 2014 Organization function: Co-organizer and Co-chair (with Prof. Asher Schmidt).
4. Organized and chaired Schulich international symposium on “Modern Electron Spin Resonance - New Methodologies and new Applications,” Haifa, Feb 2015.
5. Organizing committee of the 2017 Israeli-American Kavli Frontiers of Science Symposium, Irvine, CA, USA, Feb. 2017.
6. Co-organized (with Prof. Alon Hoffman) and co-chaired Schulich international symposium on “Diamond: From fundamental properties to quantum technologies,” Haifa, Sep. 2017.
7. Organizing committee of the 2019 Israeli-American Kavli Frontiers of Science Symposium, (to be held in Sep. 2019).