

Curriculum Vitae

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Alon HOFFMAN

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I.D. 14685713

Date and place of birth: October 22, 1958; Argentina.

Citizenship: Israeli, Australian, Argentinean.

Academic Degrees

1987 D.Sc. Physics Department, Technion - Israel Institute of Technology, Israel.
Supervised by Prof. M. Folman.

1982 B.A. (Cum Laude) Physics Department, Technion - Israel Institute of Technology, Israel.

Academic Appointments

2020- : Deputy Vice President for Research of the Technion.

2018-2020: Deputy Senior Vice President of the Technion.

2012-2016: Dean, Schulich Faculty of Chemistry, Technion, Haifa 32000, Israel.

2007-: Full Professor, Schulich Faculty of Chemistry, Technion, Haifa 32000, Israel.

1997 – 2007: Associate Professor, Schulich Faculty of Chemistry, Technion, Haifa 32000, Israel.

1992-1997: Senior Lecturer, Schulich Faculty of Chemistry Department, Technion, Haifa 32000, Israel.

1988-1990: Australia National Research Fellow (Post-Doc), Applied Physics Department, RMIT, Melbourne, Australia.

1987-1988: Research Associate (Post-Doc), Surface Science Center, Chemistry Department, Pittsburgh University, Pennsylvania, USA.

1982-1987: Junior Faculty Member, Department of Physics, Technion, Haifa 32000, Israel.

Visiting Academic Positions

February 2012 Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France

August 2010 : Visiting Professor, Physics Depart. University of Melbourne, Victoria , Australia.

August 2008 – March 2009. (Sabbatical leave) International Research Fellow of the Australian Research Council. Visiting Professor, Physics Department, University of Melbourne, Victoria 3010, Australia. Sabbatical leave.

July 2007. Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France

February 2005 Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France

August 2004 Visiting Professor, Physics Depart. University of Melbourne, Victoria , Australia.

February 2004: Visiting Professor, Physics Depart. University of Melbourne, Victoria , Australia.

August 2003. Visiting Professor, Physics Depart. University of Melbourne, Victoria , Australia.

February 2003. Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France

July-August 2002. Visiting Professor, Department of Physics and Materials Science, City University of Hong Kong, China.

September 2000. Visiting Professor, Physics Department, Laboratory of Nanospectroscopy, La Sapienza, Roma, Italy. Sabbatical leave.

February – August 2000. Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France. Sabbatical leave.

September 1999. Visiting Professor, Laboratory of Atomic and Molecular Collisions (LCAM), Bat 351, CNRS and University of Paris Sud, Orsay, France.

February 1999. Visiting Scientist, Nirim, Tsukuba, Japan.

February 1998. Visiting Scientist, Research School of Physical Sciences. And Engineering. The Australian National University, Canberra, Australia.

September 1997. Visiting Scientist, Lure, University of Paris Sud, Orsay, France.

July – August 1996. Visiting Scientist, Lure, University of Paris Sud, Orsay, France.

April 1996. Visiting Scientist, Nirim, Tsukuba, Japan.

July 1994. Visiting Fellow, Applied Physics Dept., RMIT, Melbourne, Australia.

August 1994. Visiting Scientist, Applied Physics, CSIRO, Lindfield, NSW, Australia.

Professional Experience

2001- : Consultant for the Israeli Space Program on the subject of properties of materials under upper atmosphere physico-chemical conditions.

1992 – Consultant for the Israeli microelectronic industry on subjects associated with surface science.

1990-1992: Research Scientist, Appl. Nuclear Physics, ANSTO. PMB 1 Menai, 2234 NSW, Australia.

Research Interests

1. Physico-chemical processes and properties of surfaces.
2. Electron, photon, ion and thermal stimulated processes on surfaces: ESD, SEE, QPY, TPD and IEEE.
3. Electron spectroscopy (EELS, XPS, AES, UPS, HREELS, NEXAFS) of carbon allotropes surfaces.
4. Nucleation and growth processes and mechanism of poly- and nano-crystalline diamond films.
5. Interaction of hydrogen, nitrogen and oxygen with single crystal, poly- and nano-crystalline diamond surfaces: content, bonding and thermal stability.
6. Properties of III-V semiconductor and Cu-Al surfaces.

Teaching experience

1. *Teaching assistant* at the Department of Physics, Technion (1982-1987).

First year laboratory assistant – undergraduate level.

Physics 3 – undergraduate level.

Quantum Mechanics 1 – undergraduate level.

Quantum Mechanics 2 – undergraduate level.

Physics of Atoms and Molecules – graduate level.

2. *Lecturer* at the Department of Chemistry, Technion (1992-).

Physical Chemistry 2P (for physics students) – undergraduate level.

Physical Chemistry 1B (for biology students) — undergraduate level.

Physical Chemistry M (for medicine students) – undergraduate level.

Chemistry 2CE (for civil engin. students) – undergraduate level.

Physical Chemistry of Surfaces and Interfaces –graduate level.

Experimental Methods in Surface Science –graduate level.

Chemical Thermodynamics (for Chemistry students) – undergraduate level

Technion Activities.

1992- to date: Member of the Solid State Institute.

1995- 2005: Member of the Wolfson Center for Interfaces.

2002- 2008: Member of the Committee of Patents at the Technion.

2002- 2008: Head of Chemical Center.

2010-2012: Member of the VAADA MECHINA SENATIT.

2012-2016: Dean of the Schulich Faculty of Chemistry – Technion.

2016-2018: Member of the VAADA MERAKEZET

2018-2020: Deputy Senior Vice President of the Technion

2020 -: Deputy Vice President for Research of the Technion

Public Professional Activities.

2009-2012 President of the "Israeli Vacuum Society".

1994-1997: Member of the board of the "Israeli Vacuum Society" - treasurer.

1992- to date: Referee for the scientific journals "Surface Science", "Applied Physics Letters", "Materials Research" and "Diamond and Related Materials".

1995- to date: Member of various "Vaadot Miktsioit" of the Israeli Academy of Science and the Israeli Ministry of Science and Arts.

1995- to date: Referee for a number of national and international scientific funding agencies (ISF, BSF, GIF, etc.)

Membership in Professional Societies.

1. Israeli Vacuum Society.
2. Israeli Chemical Society.

Honors

1982: First degree completed CUM LAUDE Technion, Israel.

1984: Guttwirth Fellowship. Technion, Israel.

1986: Guttwirth Fellowship. Technion, Israel.

1987: Award of distinction for outstanding research achievements, presented by the President of the Technion, Israel.

1997: David Ben-Aharony award for excellence in research.

2006: Alexander Goldberg award for excellence in research on the subject: "Nucleation and Growth of Diamond Films".

2009: Joseph Szydlowsky Chair in Sciences

Graduate students.

1. Completed Thesis

a. Ph.D.

1. K. Bovrov, (1993-1998) (maslul yashir), “Reactivity of Single Crystal Diamond Surfaces”. Present position: Research Scientist at the LCAM-CNRS, Orsay, France. 0033169154480
2. Y. Chaak, (1994-1997), “Nucleation and Growth of Diamond Films”. Present position: Technical Expert- Intel, Qiriat Gat, Israel. 0547886697
3. O. Glouzman, (1995-1999), “Diamond Deposition onto Ferrous Substrates”. Present position: Researcher, Chemistry Department, Technion, Israel. 04 6018019 (home)
4. I. Gouzman, (1995-1999), “Bias Enhanced Nucleation of Diamond Films”. Present position: Research Scientist, Soreq Nuclear Research Center, Israel. 08 9434412 (work)
5. R. Shima-Edelstein, (1995-1999), “Heterogeneous Chemical Effects of Nucleation and Growth of Diamond Films”. Present position: Research and Development Engineer, Tower Semiconductors, Migdal Ha-Emeq, Israel. 04-6506099 (work)
6. A. Heiman, (1998-2002), “Formation and Growth of Nano-Diamond Films Deposited by the DC Glow Discharge Method”. Present position: Research and Development Engineer, Tower Semiconductors, Migdal Ha-Emeq, Israel.
7. A. Laikhtman, (1999-2003), “Chemical and Physical Processes on Diamond Surfaces Under the Influence of Electromagnetic Radiation”. Present position: Lecturer at the Physics Department. HIC – Holon.
8. R. Intrater, (2000-2005). “Interaction of Ionizing Radiation with Polymer Surfaces” in collaboration with Soreq NRC and the Israel Space Program. Present position: Research Engineer, Israel Aero Space Industry, Tel Aviv, Israel. 03 9358586 (work)
9. S. Michelson, (2002- 2007), “Hydrogen Bonding in Nano-Diamond Films”. Present position: Research associate at the Chemistry Department, Technion
10. T. Kravchuk (2001-2006) (maslul yashir), “Study of Reactivity Cu-Al(100) Single Crystal Surfaces by XPS, UPS, ISS and STM”. Present position: Research associate at the Chemistry Department, Technion.
11. O. Tarniak (2002-2007) (maslul yashir), “Initial Stages of Formation and Electronic

Properties of Submicron Diamond CVD Films”.

Present position: Research engineer at the Microelectronic center- Technion.

12. Z. Shpilman (2006-2010), “Interaction of Activated Oxygen with Diamond Surfaces” (co-supervisor with Dr. I. Gouzman and Dr. J. Adler).

Present position: Research Scientist, Soreq NRC.

13. S. Elfimchev (2016-2019), “Incorporation of nitrogen and phosphorus in diamond films for thermionic energy conversion”

b. M. Sc.

1. H. Shemen, (1993-1995), ”Influence of Low energy Ar⁺ Ion Irradiation of Carbon Allotropes Surfaces”.

2. H. Geller, (1994-1997), “Carbon Nitride Formation by High Energy and High Dose N⁺ Implantation Into Carbon Allotropes Surfaces”.

Present position: Research and Development Engineer, Tower Semiconductors, Migdal Ha-Emeq, Israel.

3. I. Gouzman, (1993-1995), “ Interaction of Low Energy N⁺ Ion Bombardment into Carbon Allotropes Surfaces by in-situ Surface Electron Spectroscopy”.

Present position: Research Scientist, Soreq Nuclear Research Center, Israel.

4. A. Laikhtman, (1996-1999), “Absolute Quantum Photo-Yield of Diamond Surfaces”.

Present position: Senior Lecturer, Holon Institute of Technology, Holon Iseael,

5. S. Michelson, (1999-2002), “Deposition and Electron Emission Properties of Sub-micron Diamond Films”.

Present position: Research and Development Engineer, Tower Semiconductors, Migdal Ha-Emeq, Israel

6. M. Ronen, (2000-2003) "Non linear vibration of micro-beams in atomic force microscopy", (co-supervisor with Dr. O. Gottlieb)

7. M. Tsaref (2001-2004), “Interaction of Activated Oxygen with Silicon Nano-structures”.

Present position: Ph.D. student at the Technion.

8. O. Ofer (2002-2004) “ Hydrogen in Diamond : a Computational Study” (co-supervisor with Dr. J. Adler).

Present position: Ph.D. student at the Technion.

9. Z. Shpilman (2003-2005), “Field Electron Emission form Nano-crystalline Carbon Films”. (co-supervisor with Prof. R. Kalish).

10. O. Shwartz (2003-2006) “Study of the Primary Formation Mechanism of Nano Diamond Films”.

11. B. Zaknoon (2005-2008) “Properties of Silicon Nanostructures Studies by Scanning Probe Microscopy” (co-supervisor with A/Prof. G. Bahir).

Present position: Intel – Haifa.

12. R. Tesler (2004-2007) "Interaction of Hydrogen with InSb (100) Single Crystal Surfaces" (co-supervisor with Dr. Cecile Saguy).

Present position: R&D engineer, SCD Leshem, Israel.

13. E. Vershbosky (2005-2009) "Nano-Diamond: a Computational Study" (co-supervisor with Dr. J. Adler).

Present position: Software development in an Israeli industry.

14. A. Gisiensky (2007-2010) "Physical Properties of Diamond Surfaces".

Present position: Ph.D. candidate at the WI- Rehovot.

15. Y. Koenka (2009-2011) "Hydrogen in nano diamond films".

Present position: Ph.D. candidate in German University

16. E. Baibich (2009-2012) "Temperature dependence of electron emission properties of diamond".

Present position: Intel – Kiriath Gat, Israel.

17. E. Hojman (2010-2013) "Diamond formation onto WC-Co for tribological applications".

Present position: R&D Engineer- SCD, Leshem.

18. Y. Ladov (2008-2013) "Surface properties of III-V semiconductor surfaces"

Present position: R&D Engineer- Tower, Haifa.

19. O. Rainhertz (2011-2014) "Influence of Structural and Chemical Effects on the Thermionic Electron Emission from Polycrystalline Diamond Films".

20. M. Sasa (2012-2015) "Interaction of Low energy Nitrogen Species with Diamond Surfaces"

21. S. Elfimchev (2013-2015) "Photo-thermal Electron Emission from Polycrystalline Diamond Films"

22. Miriam Fisher (2013-2016) "Influence of Deposition Temperature and Microstructure of Cr-N Interlayer on the Adhesion of Diamond Coatings on WC-Co Substrates"

23. Dor Daniel (2016-2018) "Enhanced Cooling of Electronic Chips Using Combined Diamond Coating and Microfluidics". Army, co-supervised with Prof G. Usifon (Mechanical Engineering).

2. Thesis in Progress.

Ph.D.

M. Atrash (2016-)

M. Fisher (2017-)

Yusen (2019-)

J. Fun – visiting Ph.D. student from Prof H. Wang, Xian- China

M.Sc.

Yulia Shotsky (2018-

Research Assistants, post-docs, technical assistants.

1. A. Fayer, (1993-1995). Research assistant.
2. Dr. B. Faisger, (1994-1997). Research assistant.
3. R. Ahvaldiani, (1999- 2020). Technical assistant.
4. Dr. R. Edrei, (1997-2009) Research associate.
5. Dr. V. Gridin (2003-2004). Research assistant.
6. Eng E. Alagim (2005-) Technical assistant
7. Dr. S. Michaelson (2009-2016) Research assistant.
8. Dr. M. Chandran (2014-2017) Schulich Post-doctoral fellow from India.
9. Dr Fengnan Li (2017-2018) GTIIT Post-doctoral fellow from China
10. Dr Mohanm Kumar (2016-) Schulich Post-doctoral fellow from India.

Significant Professional Activities at the Chemistry Department

1993-1994: Planning and commissioning of second year teaching laboratory (general chemistry).

1993-1997: In charge of weekly presentations for high school students at the Chemistry Department.

1998-2000: Dean's Assistant for Research, Department of Chemistry, Technion.

1997-2000: Head of the Physical and Analytical Laboratory, Department of Chemistry, Technion

2003-2008: Head of the technical services (mechanical and electronic workshops)

2008-2011: Head of the Physical and Analytical Laboratory, Department of Chemistry, Technion

Conferences

1. Plenary or invited talks.

1. "Advanced Materials 97", Tsukuba, Japan, March 2-3, 1997, "Deuterium Interaction with the Di(111) Surface Studied by TPD, EELS and LEED". Invited lecture.
2. "Workshop on Ultra-Hard Coatings", Gyeong – Nam, Korea, July 2-3, 1997, "Diamond Film

Deposition onto Ferrous Substrates” and “ Bias Enhanced Nucleation of Diamond CVD” **Invited** lecture.

3. “Dynamical Processes in Physical Chemistry” Ein Gedi, Israel, February 1998 , “Adsorption-Desorption Phenomena of Hydrogen From Single Crystal Diamond Surfaces”. **Invited** lecture.

4. “Advanced Materials 99”, Tsukuba, Japan February 28- March 3, 1999, ”Absolute Quantum Photoelectron Yield from Diamond Surfaces”. **Invited** lecture.

5. “Currents Trends in Interface Chemistry”, Lublin - Krakow 3-7 July 2000, “Evolution and Properties of Nano-Diamond Films”. **Invited** lecture.

6. “13th International Workshop on: Inelastic Ion-Surface Collisions”, Argentina, Bariloche 20-24 November 2000, “Electron Stimulated Desorption of Hydrogen from diamond Surfaces” **Invited** lecture.

7. “International Conference on Materials Science and Technologies” Agil2000, Jerusalem, Israel, November 8-9/2000. “Mechanism and Formation of Nano-Diamond Films”. **Invited** lecture.

8. “The Second Israel – Japan Binational Workshop on Diamond Science and Technology” , Tosayamada-cho, Kochi, Japan, 6-7 December, 2001. ”Electron Photon and Thermal Stimulated Desorption of Hydrogen from Diamond Surfaces”. **Invited** lecture.

9. “Surface and Bulk Defects in CVD Diamond Films VII”, Limburgs, Belgium. March 13-15 2002. “Electron Stimulated Processes on Hydrogenated Diamond Surfaces: Desorption and Electron Emission”. **Keynote** lecture.

10. “Second Vacuum & Surface Science Conference of Asia and Australia”, Hong Kong, Hong Kong University, August 26-30, 2002. “Charge Trapping and Stimulated Desorption of H- by Resonance Electron Attachment on Hydrogenated Diamond Surfaces” . **Invited** lecture.

11. “NATO Advance Research Workshop: Syntheses, properties and applications of Ultra-nano-crystalline Diamond”, “Ultranano-crystalline Diamond 2004” , St Petersburg, Russia, June 2004. “ Mechanism and Visualization of Nano-Diamond Films Deposited by the DC-GD-CVD Process”. **Plenary** lecture.

12. “SPM2005”, June 2005, Holon, Israel. “Diamond films for Tribological Applications” . **Invited** lecture.

13. “16th European Conference on Diamond, Diamond-Like Materials, Carbon Nano-notubes & Nitrides”, Toulouse, France September 2005. “Hydrogen on Diamond Surfaces” . **Invited** lecture.

14. “Nanosmat2005 – International Conference on Surfaces, Coatings and Nano-structured materials” Aveiro, Portugal 7-9 September 2005. “Formation Mechanism of Nano-diamond Films: from Experiment to Theory”. **Invited** lecture.

15. “The France-Israel Symposium on Diamond, Carbon Nano-Structures and Related Materials”, March 6-7, 2006. Hod Hamidbar Hotel, Ein Bokek, Israel. “ Interaction of low energy electrons with diamond surfaces”. **Invited** lecture.

16. “Surface and Bulk Defects in CVD Diamond Films XIII”, Hasselt, Belgium. February 24-28, 2008. “Hydrogen in Diamond Films of Varying Grain Size in the Nanometer to Micron Range” ***Invited*** lecture.
17. “The 4th International Conference on New Diamond and Nano Carbon” NDNC 2010, May 16-20- 2010, Suzcho, China, “Hydrogen in Diamond Films”. ***Keynote*** lecture.
18. “ Adsorption of Water Molecules on Bare and Deuterated Diamond Surfaces: High resolution Electron Energy Loss Spectroscopy Studies”, Boston November 29-december 3, 2010, MRS 2010 Fall Meeting, ***Invited*** lecture.
19. “Electronic and Chemical properties of Nitrided Diamond Surfaces” Boston November 29-december 3, 2015, MRS 2010 Fall Meeting, ***Invited*** lecture.
20. “Interaction of Hydrogen with Diamond Surfaces” NDNC 2016, May 21-25-2016, Xian, China, ***Invited*** lecture.