

June 05, 2016

RESUME

Full name: **Leonid Tartakovsky**

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ACADEMIC DEGREES

- 1980 M.Sc. *summa cum laude* (*1st in the class*) in Mechanical Engineering, Moscow Automotive Mechanical Institute, USSR.
Specialization: Internal Combustion Engines
- 1986 D.Sc in Mechanical Engineering,
Central Automobile and Automotive Engines Research Institute (NAMI), Moscow, USSR.
Specialization: Heat Engines

ACADEMIC APPOINTMENTS

- Oct 2013 – present *Senior Research Fellow*, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel
- 2002 - 2013 *Adjunct Senior Lecturer*, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel
- Aug-Oct 2003 *Visiting scientist*, Environmental Studies & Testing Laboratory, TNO Automotive, TNO – Netherlands Organization for Applied Scientific Research, Delft, the Netherlands
- 1994 - 2002 *Adjunct Lecturer*, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel
- 1992 - 1996 *Research Associate*, Center of Energy and Environmental Engineering, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel
- 1983 - 1991 *Senior Research Fellow*, Department of Engines and Vehicle Emissions, Research Center for Testing and Refining of Motor Vehicles, Moscow, USSR.
- 1982 - 1983 *Junior Research Associate*, Department of automotive engines, Central Automobile and Automotive Engines Research Institute (NAMI), Moscow, USSR.

PROFESSIONAL EXPERIENCE

Oct 2013 – present	<i>Director, Internal Combustion Engines Laboratory, Center for Research in Energy Engineering and Environmental Conservation, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel</i>
1996 - 2013	<i>Chief Engineer, Internal Combustion Engines Laboratory, Center of Energy and Environmental Engineering, Faculty of Mechanical Engineering, Technion - Israel Institute of Technology, Haifa, Israel</i>
1987 - 1991	<i>Head, Engine Research Laboratory, Department of Engines and Vehicle Emissions, Research Center for Testing and Refining of Motor Vehicles, Moscow, USSR.</i>

RESEARCH INTERESTS

Advanced propulsion systems
Waste heat recovery
Combustion in Internal Combustion Engines
Internal combustion engines for UAV
Alternative fuels
Fuel atomization
Pollutant emissions
Energy and environmental impacts of vehicles

TEACHING EXPERIENCE

2014 – Present	Thermodynamics-1 034035, undergraduate
1998 – Present	Introduction to Internal Combustion Engines 035146, undergraduate
1996 – 2013	Internal Combustion Engines Laboratory 034411, undergraduate
2010 – 2013	Advanced Energy Laboratory 034410, undergraduate
2006 – Present	Supervision of senior student projects 034319, 034320, 034325, 034326, 034355, 034356 undergraduate
2013 – Present	Internal Combustion Engine Fundamentals 036082, graduate/undergrad (I taught this course since 2011 as Selected topics in Mechanical Engineering)

Newly developed courses and programs

1. 2013, Internal Combustion Engine Fundamentals 036082, graduate/undergrad

2. 2013, Advanced Automotive Propulsion Systems 036080, graduate/undergrad (jointly with Prof. Shapiro) – is taught by Dr. D. Kottick from Spring 2014 under general supervision of Dr. Tartakovsky in the framework of the Interdisciplinary ME Program on Automotive Systems Engineering
3. 2013, Control of Vehicle Emissions 036079, graduate/undergrad (jointly with Prof. Shapiro) – is taught by Dr. E. Berlin from Spring 2014 under general supervision of Dr. Tartakovsky in the framework of the Interdisciplinary ME Program on Automotive Systems Engineering
4. 2013, Laboratory on Advanced Propulsion Systems 036078, graduate/undergrad (jointly with Prof. Shapiro) – is not taught yet.
5. Interdisciplinary Program of ME in Automotive Systems Engineering (In cooperation with Prof. Shmulevich and Prof. Shapiro) – finally approved in May 2015. Currently 6 students are studying, one graduated.

TECHNION ACTIVITIES

2013– present	<i>Coordinator</i> (jointly with Prof. M. Shapiro) of the Technion's GTEP Hybrid Vehicle Technologies Program. Submitted for securing financial support in 2014
Oct 2013– present	<i>Chairman</i> , Interdisciplinary Committee on Automotive Systems Engineering. In charge of the Interdisciplinary ME Program on Automotive Systems Engineering
2014 – 2016	<i>Member</i> , Technion Transportation Research Institute
May 2014	Participation in the International Advisory Board Meeting of the Nancy & Stephen Grand Technion Energy Program (GTEP). Invited by the GTEP Chairman Prof. G. Grader to deliver a presentation on the development of an advanced hybrid propulsion system with waste heat recovery fed by renewable alcohols
2015 – present	<i>Member (representative of the Faculty of Mechanical Engineering)</i> , Steering Committee, Grand Technion Energy Program - GTEP

DEPARTMENTAL ACTIVITIES (Faculty of Mechanical Engineering)

2012 – present	Student Seminars on Advanced Propulsion Systems
2013 – present	Supervision, Engine Groups of the Formula-SAE Student projects
2014 – present	Chairman, Faculty's Committee on Safety
2014 – present	Member, Forum of Academia-Industry Relationship
2015 – present	Member, Steering Committee, Research Center for Energy Engineering and Environmental Preservation

PUBLIC PROFESSIONAL ACTIVITIES

Editor:

- 2014 *Guest Editor*, Special Issue on Low Carbon and Energy Efficient Road Vehicles, Energy and Power, 4(1A), published in 2014. DOI: 10.5923/s.ep.201401
- 2016 – present *Associate Editor*, SAE International Journal of Engines. Publisher - SAE International

Editorial board:

- 2012 – 02/ 2016 American Journal of Mechanical Engineering. Science and Education Publisher
- 2014 – 02/ 2016 International Journal of Automobile Engineering Research and Development. Transstellar Journal Publications
- 2015 – present International Journal of Vehicle Systems Modelling and Testing. Inderscience Publishers

Other professional activities:

- 2016 – present *Member*, SAE Committee on New Engines, Components, Actuators and Sensors
- 2015 – present Liaison member (as a Chairman of the SAE SETC Technical Committee), Executive Committee, SAE Powertrain, Fuels & Lubricants Activity
- 2014 *Foreign Member*, Board of Examiners of the PhD thesis, National Institute of Technology, Warangal, India
- 2012 – present *Vice-Chairman*, Technical Committee 1317 on Electric Vehicle, the Standards Institution of Israel
- 2010 – 2012 *Member (Technion representative)*, Technical Committee 1317 on Electric Vehicle, the Standards Institution of Israel
- 2003 – present *Member*, Committee on Automotive Engineering, Association of Engineers, Architects and Graduates in Technological Sciences in Israel
- 2002 - 2005 *Member (Israeli representative)*, EU COST 346 Action "Emissions and Fuel Consumption from Heavy Duty Vehicles" Management Committee, Appointed by the Ministry of Science

- 2001 *Israeli representative* at the EU PREMTECH (Advanced propulsion systems and emission reduction technologies) final dissemination event. Appointed by the Ministry of Transportation

MEMBERSHIP IN PROFESSIONAL SOCIETIES

- SAE – International Society of Automotive Engineers
ISEEQS – Israel Society for Ecology and Environmental Quality Sciences
ASME – American Society of Mechanical Engineers

HONORS & AWARDS

- 2016: Excellence in Teaching, Technion, Citation
2015: SAE Fellow
2014: Uzi & Michal Halevy Grant for Innovative Applied Engineering Research
2013: Excellence in Teaching, Technion, Citation
2012: Excellence in Teaching, Technion, Citation
2010: Excellence in Teaching, Technion, Citation
1998: Science on Service of Environment – Leading Research Projects in the field. Israeli Ministry of Environment, Special Jubilee edition of selected studies (together with Y. Zvirin, M. Gutman, E. Golgotiu, Y. Aleinikov)

GRADUATE STUDENTS

PhD students

Theses in progress:

1. *Arnon Poran*, direct track to doctorate, started in September 2014, "Transient effects in a spark ignition engine operated by products of reformed alcohol", additional supervisor - Prof. M Shapiro, PhD in the Grand Technion Energy Program, *REAMIM Program for distinguished students*, ***Summa Cum Laude*** – 2012, *Jacobs scholarship for academic excellence* – 2013, *Fein scholarship for academic excellence* – 2014, *Rieger Foundation-Jewish National Fund Fellow in Environmental Studies* – 2015, *MOST scholarship for PhD students and post-docs in oil replacements for transportation* – 2015, *Best Poster Award 5th Conference on UAV Propulsion Technologies* - 2016 [J20¹, Cpl1², P6, J26, J27, Cil12].

M.Sc. students

Completed theses:

¹ Publications with students, [J20] – position #20 in the list of refereed papers in professional journals

² Publications with students, [Cpl1] – position #1 in the list of plenary lectures at the conferences

1. *Nir Tsabar*, 2002, "Oxygen enrichment of intake air for improving the performance of internal combustion engines and reducing the emission of pollutants", primary supervisor - Prof. Y Zvirin. Today – Dr. Nir Tsabar holds a senior position at Rafael – Advanced Defense Systems Ltd.
2. *Shai Bengio*, 2010, "Remote sensing of emissions by diesel engine vehicles", primary supervisor - Prof. Y Zvirin, [P5]³. Current position: Major, Section Head, IDF.
2. *Ilia Shir*, 2010, "Remote sensing of emissions from vehicles with spark ignition engines", primary supervisor - Prof. Y Zvirin, [P5]. Current position: Major, Section Head, IDF.
3. *Jonathan Tenenbaum*, 2013, "Formulation of an improved dynamic model of fuel injection in DI diesel engine", primary supervisor - Prof. M Shapiro, *BRAKIM Student – a special B.Sc. & M.Sc. program for distinguished students*, [J21, C30]. Current position: Captain, IDF.
4. *Yuri Shukhman*, 2014, "Study of internal combustion engine's sensitivity to ambient conditions", primary supervisor - Prof. M Shapiro, [J16]. Current position: Major, Section Head, IDF.
5. *Ahmad Omari*, 2015, "Laminar burning velocity measurements of alcohol steam reforming products", additional supervisor - Prof. M Shapiro, MSc in the Grand Technion Energy Program, *REAMIM Program for distinguished students*, **Summa Cum Laude** – 2012, *Wolberg excellence award*, *Technion VP award for the Technion-Formula initiative*, *VATAT Scholarship*, *Ministry of Energy and Water Resources Scholarship* – 2013 [J24, J28]. Current position: PhD student at RWTH Aachen University (Germany).
6. *Or Cesana*, 2016, "Internal Combustion Engine with thermochemical recuperation fed by ethanol steam reforming products", additional supervisor - Prof. M Shapiro, *BRAKIM Student – a special B.Sc. & M.Sc. program for distinguished students* [CP32]⁴. Current position: Lieutenant, IDF.

Theses in progress:

7. *Ran Amiel*, started in 2014, expected year of graduation – 2017, "Study of knock formation in the UAV engine" [J23, J27, J29, CP31, C33].
8. *Rafael Fleischman*, started in 2014, expected year of graduation – 2017, "Pollutant emissions of SI engine fed by the methanol reforming products", *HIAS scholarship for academic achievements and community service* – 2014, *Selim and Rachel Benin scholarship* – 2014 [J27, CP30, CP31, C29, C32, C33].
9. *Amnon Eyal*, started in 2014, expected year of graduation – 2017, "Management of the HCCI process by control of the alcohol reforming products composition" [J30]
10. *Guy Ben Haim*, started in 2014, expected year of graduation – 2017, "Hybrid propulsion system with Wankel engine for UAV".

³ Patents with students, [P5] – position #5 in the list of patents

⁴ Papers with students in Proceedings of International Conferences, [CP32] – position #32 in the list of papers

11. *Ilia Hanin*, started in 2014, expected year of graduation – 2017, "Performance and emissions (emphasis on nanoparticles) of a diesel engine fed by the alternative renewable fuel Dimethyl-Ether (DME)"
12. *Aviad Haviv*, started in 2015, expected year of graduation – 2017, "Performance improvement of UAV engines at high altitudes", *BRAKIM Student – a special B.Sc. & M.Sc. program for distinguished students*.
13. *Evgeny Guy*, started in 2015, expected year of graduation – 2018, "Heat transfer in an internal combustion engine with the high-pressure thermo-chemical recuperation of exhaust gas energy", additional supervisor - Prof. M Shapiro, MSc in the Grand Technion Energy Program, *REAMIM Program for distinguished students*.
14. *Galia Faingold*, started in 2016, expected year of graduation – 2018, "Computational fluid dynamics modeling of reformat fuel mixing and combustion in IC engine", additional supervisor, responsible supervisor – Prof. S. Frankel.

M. E. students

Completed:

1. *Tamir Shemesh*, 2012, "Thermodynamic analysis of internal combustion engine fed by ethanol decomposition products". Current position: Officer, IDF.
2. *Avihai Levi*, 2013, "Fuel injection system for SI engine fed by alcohol reforming products". Current position: Mechanical Engineer, Rafael – Advanced Defense Systems Ltd.
3. *Doron Popescu*, 2015, "Measurement and analysis of engine's combustion characteristics", [J11, J15, J17, CP25, CP26]. Current position: Test Engineer, P3 Group, Germany.
4. *Sergei Irlin*, 2015, "Direct injection of gaseous fuel in SI engines". Current position: Mechanical Engineer, ISCAR.
5. *Victoria Abramesco*, 2016, "Air pollution by nanoparticles in a train car and the Tel-Aviv Ha-Shalom Train Station".
6. *Yarden Harpaz*, 2016, "Nanoparticles characterization and morphology analysis". Current position: Officer, IDF.

In progress:

7. *Inna Zohar*, started in 2014, "Self-ignition occurrence in spark-ignition engines of UAVs"
8. *Gilad Openheim*, started in 2015, "Study of air pollution by nitrogen oxides in a bus and a train car"
9. *Omer Ventura*, started in 2016, "Flame propagation in a system with multiple ignition sources"
10. *Alexey Galianov*, started in 2016, "Study of the influence of fuel supply method on the performance of internal combustion engine with thermo-chemical recuperation of waste heat".

Graduate Students' supervision as a consultant

1. *Gil Golan, M.Sc.*, 1997, "Experimental and theoretical investigation of temperature and stress fields in internal combustion engines", primary supervisor - Prof. Y Zvirin. Current position: Director, Advanced Technical Center – Israel, General Motors.
2. *Essam Totari, M.Sc.*, 1998, "Measurement of particulates emission from diesel engine by dilution tunnel", primary supervisor - Prof. Y Zvirin. Current position: Dr. Totari teaches at the Technion and various Colleges.
3. *Yitshak Harpaz, M.Sc.*, 1998, "Introduction of methanol into the intake air of diesel engine for combustion improvement", primary supervisor - Prof. Y Zvirin.
4. *Avner Flor, M.Sc.*, 2003, "Use of gas as alternative fuel for vehicles in Israel", primary supervisor - Prof. Y Zvirin, additional supervisor - Prof. J. Dayan, [C16]. Current position: Senior Deputy Director-General, Ministry of Transportation.
5. *Alon Davidy, PhD.*, 2004, "Theoretical and experimental study of remote sensing for measuring emission of pollutants", primary supervisor - Prof. Y Zvirin, [C10, C22]. Current position: Senior researcher, Israel Military Industries.

RESEARCH GRANTS

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|------------|---|
| 1995-1996: | Israeli Ministry of Energy and Infrastructure, \$23,000, Properties of petroleum liquid fuels marketed in Israel in comparison with selected other countries. <u>Researcher</u> , PI: Y. Zvirin. |
| 1995-1996: | Israel Electric Corp., \$11,000, Electric vehicles: State of the art review and design of preliminary experiment. <u>Researcher</u> , PIs: Y. Zvirin, Y. Dayan. |
| 1996-1997: | Israeli Ministry of Environment, \$20,000, Study of Israeli urban driving pattern and its application to pollutants inventory by estimating emission factors of gasoline vehicles. <u>Senior Researcher</u> , PIs: Y. Zvirin, Y. Dayan. |
| 1996-1997: | "Egged" Israel Transportation Corp. and the S. Neeman Institute for Advanced Studies in Science & Technology at the Technion, \$50,000, Electric and hybrid buses for public transportation. <u>Researcher</u> , PIs: Y. Zvirin, Y. Dayan. |
| 1996-1997: | Israeli Defense Ministry, \$10,000, Study of additives for lubrication oil (friction modifiers) for improving the performance of diesel engines. <u>Researcher</u> , PI: Y. Zvirin. |
| 1997-1998: | Israel Electric Corp., \$26,500, Electric vehicles with zinc - air batteries: design of experiments with vans and development of a bus concept. <u>Researcher</u> , PI: Y. Zvirin. |
| 1997-2001: | Israel - Mexico Energy Foundation and Henry Ford III Transportation Foundation, \$60,000, Development of public transportation systems based on environmental friendly vehicles. <u>Senior Researcher</u> , PIs: Y. Zvirin, M. Ron, Y. Shiftan. |
| 1997-1998: | Israeli Ministry of Defense, \$10,000, Prevention of moisture accumulation on windows of heavy-duty vehicles. <u>Researcher</u> , PI: Y. Zvirin. |

- 1998-1999: Israeli Ministry of Defense, \$23,000, Study of diesel fuel lubricity. Researcher, PI: Y. Zvirin.
- 1998-2000: Israeli Ministry of Environment and the Belfer Foundation for Energy Research, \$34,000, Assessment of emission factors of diesel buses in Israel. Senior Investigator, PI: Y. Zvirin.
- 1999-2000: Israeli Ministry of Environment and the Belfer Foundation for Energy Research, \$35,000, Measurements of emissions from motor vehicles by remote sensing. Senior Investigator, PI: Y. Zvirin.
- 1999-2000: Israeli Ministry of Transport, \$30,000, Development of methods and equipment for a testing of catalytic converters. Senior Investigator, PI: Y. Zvirin.
- 1999-2000: Foundation for Environment Quality, \$20,000, Estimate of pollutants emissions from motor vehicles in the Haifa Metropolis. Senior Investigator, PI: Y. Zvirin.
- 2000-2003: Israeli Ministries of National Infrastructures, Transport, Defense and Environment, Railway Division of the Israeli Port and Train Authority, the Israeli Transportation Corps. ("Eged" and "Dan"), "Volvo", and "Delek" Oil Co., \$70,000, Study of detergent additives for diesel fuel. Senior Investigator, PIs: Y. Zvirin, M. Gutman.
- 2000-2005: European Commission (EC), FP5, €143,000, Assessment of road transport emissions and inventory systems (ARTEMIS), This research project is part of a big program, carried out by a consortium coordinated by Dr. J. Hickman and Dr. I. McRae, Transportation Research Laboratory (TRL), UK. Our participation is in the work-package: Assessment of Emissions by Heavy-Duty Vehicles (WP400), coordinated by Prof. S. Hausberger, Technical University Graz (Austria). WP400 budget is ~2 MEu, and partners include TUV (Germany), VITO (Belgium), INRETS and RATP (France), TNO (the Netherlands), AVL (Austria), EMPA (Switzerland), IVL (Sweden), KTI (Hungary), and others. Senior Investigator, PI: Y. Zvirin.
- 2000-2004: Israeli Ministry of Environment, \$65,000, Reduction of pollutants emissions from diesel bus engines by using oxidation catalysts and particulate traps. Co-Principal Investigator, PI: Y. Zvirin.
- 2001-2003: Israeli Ministry of Transportation, \$46,000, Development of test procedures for diesel engine smoke measurements. Senior Investigator, PI: Y. Zvirin, Co-PI: M. Gutman.
- 2001-2004: Israeli Ministry of Environment, \$ 44,000, Assessment of emission factors of diesel trucks in Israel. Co-Principal Investigator, PI: Y. Zvirin.
- 2001-2003: European Commission (EC), FP5, €129,000, Cybernetic cars for a new transportation system in the cities (CyberCars). This research project is part of a big program, carried out by a consortium coordinated by Dr. M. Parent, INRIA (France). Our participation is mainly in the work-packages related to Energy and Environment. CyberCars budget is 5.07 MEu, and partners

- include Fiat Research Center and University of Rome (Italy), Robosoft and EDF (France), TNO and Frog (the Netherlands), Ruf (Denmark), SSA, GEA and Autos & Energy (Switzerland), Universities of Bristol and of Southampton, (UK), University of Coimbra (Portugal), and participation of several European cities. Senior Investigator, PI: Y Zvirin.
- 2001-2003: European Commission (EC), FP5, €181,000, Cybernetic Transportation Systems for the Cities of Tomorrow (CyberMove). This research project is part of a big program, carried out by the same consortium of CyberCars, coordinated by Dr. M. Parent, INRIA (France). Our participation is mainly in the work-packages related to Field Experimentations, Energy, Environment and economic analyses. CyberMove budget is 4.08 MEu. Senior Investigator, PI: Y Zvirin
- 2002-2003: Israeli Airports Authority, \$18,000, Reduction of pollutants emission by off-road vehicles in airports, Co-Principal Investigator, PI: Y. Zvirin.
- 2002-2003: Israeli Oil Refineries, \$8,000, Study of the performance of low sulfur diesel fuel. Senior Investigator, PI Y. Zvirin, Co-PI: M. Gutman.
- 2003-2004: Delek Israeli Oil Co., \$21,000, Effect of diesel fuel additives on engine performance. Senior Investigator, PI: Y. Zvirin, Co-PI: M. Gutman.
- 2003-2006: Israeli Ministry of Environment, \$45,000, Effectiveness and intactness of catalytic converters for gasoline vehicles. Senior Investigator, PI: Y. Zvirin, Co-PI: M. Gutman.
- 2004-2006: Haifa Region Association of Cities for the Environment, \$40,000, Exposure of drivers and transportation users to air pollution inside vehicles at driving conditions typical to Haifa. Co-Principal Investigator, PI: Y. Zvirin.
- 2005: DAN Transportation Co., \$6,000, Study of exhaust temperature distribution in real-world driving of urban buses in Tel-Aviv. Co-Principal Investigator, PI: Y. Zvirin.
- 2005-2008: Israeli Ministry of Environment, \$36,000, Simulation of diesel particulate traps operation. Senior Investigator, PI: Y. Zvirin.
- 2005-2006: Ministry of Environment and the Municipality of Petach-Tikva, \$26,000, Road tests of garbage trucks retrofitted by aftertreatment systems in Petach-Tikva. Co-Principal Investigator, PI: Y. Zvirin.
- 2005-2006: Israeli Ministry of Defense, \$26,000, Analysis of military diesel engine failure and development of a strategy for failure prevention. Senior Investigator, PI: Y. Zvirin.
- 2005-2006: MAFAT, Israeli Ministry of Defense, \$16,000, Analysis of heat transfer in the cooling jacket of a two-stroke SI UAV engine. Senior Investigator, PI: Y. Zvirin.
- 2005-2006: Yaffe Nof Transport Planning, \$60,000, Road tests and performance analysis of Phileas hybrid bus. Co-Principal Investigator, PI: Y. Zvirin.

- 2005-2006: FRICSO Ltd., \$23,000, Assessment of the effects of CMR surface treatment on diesel engine performance. Co-Principal Investigator, PI: Y. Zvirin.
- 2005-2006: Israeli Ministry of Transport, \$26,000, Assessment of implementation issues of novel technologies for conventional and alternative vehicle propulsion systems. Senior Investigator, PI: Y. Zvirin, Co-PI: M. Gutman.
- 2006-2007: MAFAT, Israeli Ministry of Defense, \$25,000, Survey on SI engines conversion to heavy fuels. Senior Investigator, PI: Y. Zvirin.
- 2006-2007: Aeronautics Defense Systems Ltd., \$33,500, Study of the Design of Air-Cooled Two-Stroke SI 498i Engine – Analysis of Air Cooling System. Senior Investigator, PI: Y. Zvirin.
- 2006-2007: Logus Ltd. (USA), \$21,000, Effects of additives to diesel fuel and lubrication oil on engine performance. Co-Principal Investigator, PI: Y. Zvirin.
- 2006-2011: European Commission (EC), FP6, €65,000, CityMobil - Towards advanced road transport for the urban environment. This research project is a continuation of the CyberCars and CyberMove EC Projects mentioned above. It is coordinated by J. Van Dijke, TNO (Holland). The total CityMobil budget is about €10 M. Senior Investigator, PI: Y. Zvirin.
- 2007-2008: Israeli Ministry of Environment, \$36,000, Implementation of natural gas use for vehicle propulsion. Senior Investigator, PI: Y. Zvirin.
- 2008: Israeli Ministry of Environment, \$5,000, Survey of automotive renewable fuels. Senior Investigator, PI: Y. Zvirin.
- 2007-2008: MAFAT, Israeli Ministry of Defense, \$40,000, Simulation of Wankel engine performance. Senior Investigator, PI: Y. Zvirin.
- 2007-2008: Israeli Ministry of Environment, \$25,000, Development of an outline for a standard for emissions test of in-use two- and three-wheel vehicles. Co-Principal Investigator, PI: Y. Zvirin.
- 2007-2008: Aeronautics Defense Systems Ltd., \$69,000, Analysis and Improvement of Crankshaft Design for 498i Engine. Senior Investigator, PI: Y. Zvirin.
- 2006-2008: Israeli Ministry of Environmental Protection, \$36,000, Experimental assessment of in-use catalytic converters efficiency. Co-Principal Investigator, PI: Y. Zvirin.
- 2009-2011: MAGNETON project, sponsored by the Israeli Ministry of Industry and Trade (collaboration with Aeronautics Defense Systems Ltd.), \$290,000, Development of SI engine fueled by heavy fuels for UAV. Senior Investigator, PI: Y. Zvirin.
- 2008-2011: MAFAT, Israeli Ministry of Defense, \$70,000, Numerical analysis and performance simulation of SI UAV engine. Senior Investigator, PI: Y. Zvirin.
- 2009-2011: MAFAT, Israeli Ministry of Defense, \$110,000, Study of internal combustion engine's sensitivity to ambient conditions. Senior Investigator, PIs: Y. Zvirin, A. Marmur.

- 2008-2010: Israeli Ministry of Defense, \$45,000, Analysis and performance simulation of the tank engine. Senior Investigator, PI: Y. Zvirin.
- 2009-2010: Egged and Dan Transportation Co., \$34,000, Comparison of emissions by urban buses and passenger cars in Israel. Co-Principal Investigator, PI: Y. Zvirin.
- 2010-2012: European Commission (EC), FP7, €93,500, CONDUITS – Evaluating the Impact of ITS in Urban Areas. Our contribution is an assessment of energy and environmental impacts of ITS. Senior Investigator, PIs: D. Mahalel, Y. Zvirin.
- 2011-2012: MAFAT, Israeli Ministry of Defense, \$60,000, Study of big diesel engine sensitivity to ambient conditions. Senior Investigator, PI: A. Marmur.
- 2011-2012: MAFAT, Israeli Ministry of Defense, \$105,000, Study of air mixing with heavy fuel and prediction of UAV engine performance. Senior Investigator, PI: M. Shapiro.
- 2011-2014: Israeli Ministry of Energy and Water Resources, \$210,000, Study of engine for hybrid propulsion system fueled by methanol reforming products. Senior Investigator, PIs: M. Shapiro and M. Sheintuch.
- 2012-2014: Israeli Ministry of Environmental Protection, \$25,000, Theoretical study of the potential of catalytic converter's efficiency monitoring onboard a vehicle with aid of remote sensing technology. Co-Principal Investigator, PI: M. Shapiro.
- 2012-2016: Israel Science Foundation, \$420,000, Dynamics of Alcohol Fueled Reformer-Internal Combustion Engine System. Senior Investigator, PIs: M. Shapiro and M. Sheintuch.
- 2012-2013: MAFAT, Israeli Ministry of Defense, \$50,000, Improvement of fuel-air mixing by activation of the impingement surface. Co-Principal Investigator, PI: M Shapiro.
- 2010-2014: European Commission (EC), FP7, €182,000, CATS – City Alternative Transport System, coordinated by Thierry Chanard, GEA (Switzerland). The total CATS budget is about €4 M. Principal Investigator.
- 2012-2014: Israeli Ministry of Environmental Protection, \$50,000, Study of environmental impacts of spark ignition engine fueling by methanol reforming products, Principal Investigator.
- 2012-2014: Wolfson Foundation, \$82,000, Hybrid propulsion system with ICE fueled by alcohol reforming products, in the project "Gas & Oil in the Eastern Mediterranean Basin". Senior Investigator, PI: M. Sheintuch.
- 2013-2015: Israeli Ministry of Environmental Protection, \$54,000, Study of the environmental implications of operating passenger cars on alternative fuels (oil substitutes) in using conditions typical for Israel. Co-Principal Investigator, PI: M Shapiro.

- 2013-2014: MAFAT, Israeli Ministry of Defense, \$60,000, Automotive engine adaptation to UAV applications. Co-Principal Investigator, PI: M Shapiro.
- 2014-2015: Israeli Ministry of Environmental Protection, \$86,000, A comparative study on the influence of reforming method of different alcohols (ethanol, methanol) on the environmental impact and the performance of an engine with thermo-chemical recuperation of the exhaust gas energy, Principal Investigator.
- 2014-2015: MAFAT, Israeli Ministry of Defense, \$70,000, Study and improvement of UAV engine performance in a real flight conditions. Principal Investigator
- 2015-2016: Israeli Ministry of Environmental Protection, \$50,000, Environmental implications of diesel engines feeding by the alternative renewable fuel dimethyl ether (DME). Principal Investigator
- 2015: Israeli Ministry of Environmental Protection, \$25,000. Study of air pollution by nanoparticles at the Jerusalem central bus station, in buses and in trains. Principal Investigator
- 2015-2016: Israeli Ministry of Environmental Protection, \$84,000. Environmental implications of lubricant type selection for the engine fed by syngas with a focus on nanoparticle emissions. Principal Investigator
- 2015-2016: Egged Ltd, \$27,000. Field experiments with buses retrofitted by diesel particle filters. Principal investigator
- 2015-2016: MAFAT, Israeli Ministry of Defense, \$65,000, Study of knock phenomena in UAV engine in a real flight conditions. Principal Investigator
- 2016 Israel Aerospace Industries, \$15,000, Study of a supercharging system for UAV engine. Principal Investigator
- 2016-2017 European Commission (Joint Research Center – JRC), Israel Ministry of National Infrastructures, Energy and Water Resources, \$154,000, ART: Autonomous Road Transportation. Our contribution: assessment of energy and environmental impacts of ART. The consortium includes JRC, Technion, TSS (Spain), the University of Birmingham (UK). Project coordinator: Biagio Ciuffo (JRC). Co-Principal Investigator, PI: T. Toledo.
- 2016-2018 Israel Ministry of National Infrastructures, Energy and Water Resources, \$130,000, High-Pressure Thermo-Chemical Recuperation for Direct-Injection Internal Combustion Engine Fed by the Methanol Reforming Products. Principal Investigator, Co-PI: M. Sheintuch.
- 2016-2017 Israel Ministry of Transportation, \$78,000, Feasibility study of a transportation system based on electric infrastructure. Co-Principal Investigator, PI: S. Bekhor.
- 2016-2017 Haifa District Municipal Association for Environmental Protection, \$55,000, Study of diesel particle filter and fuel type effects on nanoparticle emissions by garbage trucks. Principal Investigator

SIGNIFICANT PROFESSIONAL PROJECTS

1995	Investigation of cracks formation mechanism in the engine of a combat car "Abir", supported by the Ministry of Defense (with Y. Zvirin).
1997 – 2000	Development of the National Database of Vehicle Emission Factors, supported by the Israeli Ministry of Environmental Protection (with Y. Zvirin).
2000 – 2001	Development of the strategy of lead phasing-out from the gasoline in Israel, supported by the Israel Fuels Authority (with Y. Zvirin).
2006 – 2008	Improvement of the design and performance of 2-stroke spark ignition UAV engines, supported by Aeronautics Defense Systems (with Y. Zvirin).
2013 – present	National program on reduction of nanoparticle emissions from heavy-duty diesel vehicles by retrofitting diesel particle filters. Involved: Ministry of Environmental Protection, Ministry of Transportation, Egged, Dan, Haifa District Municipal Association for Environmental Protection, VERT (international association for emissions control). About 4000 heavy-duty diesel vehicles are to be retrofitted with DPF in the next four years.

PUBLICATIONS

Theses

M.Sc. – Final Project topic: "Development and analysis of combustion chamber for automotive gas-turbine engine", 1980. Moscow Automotive Mechanical Institute

D.Sc – Thesis topic: "Study of gas dynamics in the turbocharger ducts of a diesel engine", 1986. Central Automobile and Automotive Engines Research Institute (NAMI), Moscow

Refereed papers in professional journals

Papers published in Russian

1. L. Tartakovsky, Interaction of turbulent flows in pulse-converter of turbo-charged engine. *NAMI Transactions*, vol. 186, 61-66, Moscow, USSR, 1982.
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8. M. Gutman*, L. Tartakovsky, Y. Zvirin and A. Serry: Problems of Air Pollution by Road Transport in Israel. 7th Int. Conf. On Environmental Challenges for the Next Millennium, Jerusalem, June 1999.

9. Y. Shiftan, Y. Zvirin* and L. Tartakovsky: Contribution of transportation to emission of greenhouse gases in Israel and measures for its reduction. 7th Int. Conf. On Environmental Challenges for the Next Millennium, Jerusalem, June 1999.
10. M. Gutman*, L. Tartakovsky, Y. Aleinikov, V. Baibikov, M. Veinblat and Y. Zvirin: Estimation of air pollution from airport tractors. Int. Conf. "Living with global change: challenges in environmental sciences", Rehovot (Israel), May 30 – June 1, 2005.
11. Y. Zvirin*, M. Parent, L. Tartakovsky, Challenges of Sustainable Transport: Providing Mobility while Conserving Energy and Environment, International AFHB Anniversary Conference, Technical University Biel, Switzerland, April 2009.
12. L. Tartakovsky* and Y. Zvirin: Study of Air Pollution inside a Vehicle. 1st Int. Workshop on Nano-Particle Emissions from IC-Engines. Tel-Aviv, June 17, 2010.
13. L. Tartakovsky, V. Baibikov, J. Czerwinski, M. Gutman, M. Kasper, M. Veinblat and Y. Zvirin: Measurements of Particulates Concentrations inside Vehicle Cabin. 14th ETH-Conference on Combustion Generated Nanoparticles, Zurich (Switzerland), August 1-4, 2010 (*poster*).
14. L. Tartakovsky, V. Baibikov, M. Gutman, A. Mosyak*, M. Veinblat: Performance analysis of SI engine fueled by ethanol steam reforming products. SAE 2011 Int. Powertrains, Fuels & Lubricants Meeting, Kyoto, Japan, September 2011.
15. L. Tartakovsky*, Baibikov, V., Veinblat, M., Popescu, D., Zvirin, Y., Gutman, M. Mileage Influence on Conversion Efficiency of Catalytic Converter from In-Use Vehicles. SAE 2012 Int. Powertrains, Fuels & Lubricants Meeting, Malmo, Sweden, September 2012.
16. L. Tartakovsky, V. Baibikov, M. Gutman*, M. Veinblat, J. Reif: Simulation of Wankel engine Performance Using a Commercial Software for Piston Engines. 18th SAE/JSME Small Engine Technology Conference – SETC 2012, Madison WI, USA, October 16-18, 2012.
17. Y. Shukhman, V. Baibikov, A. Marmur, M. Veinblat, L. Tartakovsky*: Internal combustion engine response to presence of combustion inhibitors in the ambient air. 2013 SAE World Congress, Detroit MI, USA, April 2013.
18. L. Tartakovsky*: In-vehicle air pollution by ultrafine particles and ways of its mitigation. 2nd International Workshop on Nano-Particle Emissions from IC-Engines. Tel-Aviv, June 10, 2013.
19. L. Tartakovsky*, Baibikov, V., Veinblat, M.: Comparative performance analysis of SI engine fueled by ethanol and methanol reforming products. SAE 2013 Int. Powertrains, Fuels & Lubricants Meeting, Seoul, Korea, October 2013.
20. A. Poran*, M. Artoul, M. Sheintuch, L. Tartakovsky: Modeling Internal Combustion Engine with Thermo-Chemical Recuperation of the Waste Heat by Methanol Steam Reforming. 2014 SAE World Congress, Detroit MI, USA, April 8-10, 2014.
21. L. Tartakovsky*, V. Baibikov, P. Comte, J. Czerwinski, A. Mayer and M. Veinblat: A potential of diesel particle filters as a tool for nanoparticles emission reduction by heavy-duty diesel buses. 6th International Conference on Advanced Concepts in Mechanical Engineering ACME – 2014, “Gheorghe Asachi” Technical University of Iași, Romania, June 12-13, 2014.

22. D. Popescu, G. Ben-Haim, L. Tartakovsky: Ultrafine particle concentrations inside a car – cabin filter effects. International Conference on Aerosol Technology, Karlsruhe, Germany, 16 - 18 June, 2014 (*poster*).
23. L. Tartakovsky, V. Baibikov, P. Comte, J. Czerwinski*, A. Mayer and M. Veinblat: Analysis of ultrafine particle emissions by in-use buses of different generations. 18th ETH-Conference on Combustion Generated Nanoparticles, Zurich (Switzerland), June 22-25, 2014.
24. L. Tartakovsky, V. Baibikov, J. Czerwinski, M. Kasper, D. Popescu and M. Veinblat: Effects of a cabin filter on ultrafine particle concentrations inside passenger cars. 18th ETH-Conference on Combustion Generated Nanoparticles, Zurich (Switzerland), June 22-25, 2014 (*poster*).
25. L. Tartakovsky*, V. Baibikov, J. Czerwinski, A. Mayer, M. Veinblat: Diesel Particle Filter – an Efficient Tool for Mitigation of Nanoparticle Emissions from In-Use Heavy-Duty Vehicles. 3rd International Workshop on Nanoparticle Emissions from Heavy-Duty Engines, Tel-Aviv, September 8-9, 2014.
26. J. Tenenbaum*, M. Shapiro, L. Tartakovsky: An Analytical Model of a Two-phase Jet with Application to Fuel Sprays in Internal Combustion Engines. 20th SAE/JSAE Small Engine Technology Conference – SETC 2014, Pisa, Italy, November 18-20, 2014.
27. L. Tartakovsky*, R. Amiel, V. Baibikov, M. Veinblat: Prevention of fuel film formation by ultrasonic activation of the fuel spray impingement surface. SAE 2015 World Congress, Detroit MI, USA, April 21-23, 2015.
28. A. Omari*, M. Shapiro, L. Tartakovsky: Laminar burning velocity of alcohol steam reforming products and effects of cellularity on flame propagation. SAE 2015 World Congress, Detroit MI, USA, April 21-23, 2015.
29. R. Fleischman*, L. Tartakovsky: Nanoparticle Emissions from an SI Engine Fueled with Gasoline and Methanol Reforming Products. 19th ETH Conference on Combustion Generated Nanoparticles, Zurich, Switzerland, June 28 – July 1, 2015.
30. J. Tenenbaum, M. Shapiro and L. Tartakovsky: An Analytical Model of a Gas-Droplet Jet with Application to Fuel Sprays in Internal Combustion Engines. The 2015 European Aerosol Conference, Milan, Italy, September 6-11, 2015 (*poster*).
31. L. Tartakovsky*, R. Amiel, V. Baibikov, R. Fleischman, M. Gutman, A. Poran, M. Veinblat: SI Engine with Direct Injection of Methanol Reforming Products – First Experimental Results. 21st SAE/JSAE Small Engine Technology Conference – SETC 2015, Osaka, Japan, November 17-19, 2015.
32. R. Fleischman, R. Amiel, L. Tartakovsky: Buses retrofitting with diesel particulate filters: effects on nanoparticle emissions and vehicle performance. 20th ETH Conference on Combustion Generated Nanoparticles, Zurich, Switzerland, June 13 – 16, 2016 (*poster*).
33. L. Tartakovsky*, R. Amiel, R. Fleischman: Effects of diesel particle filters on performance of in-use buses. 4th International Workshop on Nanoparticle Emissions from Heavy-Duty Engines, Haifa, June 21, 2016.

Participation in organizing conferences

2004 – 2015	<i>Member, Organizing Committee, Israeli Conference on Automotive Engineering, Herzlia.</i>
2005	<i>Chairman, Morning session, Israeli - Italian Workshop on advances and collaboration in Automotive Industry, Tel-Aviv, March 2005.</i>
2010	<i>Chairman, Organizing Committee, 1st International Workshop on Nano-Particle Emissions from IC-Engines. Tel-Aviv, June 17, 2010.</i>
2012 – present	<i>Founding Chairman, Organizing Committee, 1st – 5th Conferences on Propulsion Technologies for Unmanned Aerial Vehicles, Technion, Haifa. About 220 participants in 2016.</i>
2013	<i>Chairman, Organizing Committee, 2nd International Workshop on Nano-Particle Emissions from IC-Engines. Tel-Aviv, June 10, 2013.</i>
2014	<i>Member, Scientific Committee, 6th International Conference on Advanced Concepts in Mechanical Engineering, Iasi, Romania, June 12-13, 2014.</i>
2014	<i>Co-chairman, Automotive and Thermal Combustion Engines session ACME-05-4, 6th International Conference on Advanced Concepts in Mechanical Engineering, Iasi, Romania, June 12-13, 2014.</i>
2014	<i>Chairman, Organizing Committee, 3rd International Workshop on Nano-Particle Emissions from Heavy-Duty Vehicles. Tel-Aviv, September 8-9, 2014.</i>
2014	<i>Member, General Committee, SAE Small Engine Technology Conference (SETC)</i>
2014	<i>Member, Technical Committee, SAE Small Engine Technology Conference (SETC)</i>
2014	<i>Co-organizer, Emissions sessions, 20th SAE Small Engine Technology Conference (SETC), Pisa, Italy, November 18-20, 2014.</i>
2014	<i>Chairman, Emissions session – part 1 of 3, 20th SAE Small Engine Technology Conference (SETC), Pisa, Italy, November 18-20, 2014.</i>
2015	<i>Organizer and Chairman, Propulsion Systems & Vehicle Engineering sessions, 33rd Israeli Conference on Mechanical Engineering – ICME 2015, Tel-Aviv, March 2-3, 2015.</i>
2015 - 2017	<i>Chairman, SAE Technical Committee, Small Engine Technology Conference (SETC)</i>
2015	<i>Organizer and Co-Chairman, Emissions sessions, 21st SAE Small Engine Technology Conference SETC-2015, Osaka, Japan, November 17-19, 2015.</i>
2016	<i>Organizer, session FFL 270 “Combustion in Gaseous Fueled Engines”, SAE 2016 International Powertrain Fuels & Lubricants Meeting, Baltimore, Maryland, USA, October 24-26, 2016.</i>

- 2016 *Organizer, session FFL 540 “Small Engines Technology”, SAE 2016 International Powertrain Fuels & Lubricants Meeting, Baltimore, Maryland, USA, October 24-26, 2016.*
- 2016 *Member, Scientific Committee, 7th International Conference on Advanced Concepts in Mechanical Engineering, Iasi, Romania, June 9-10, 2016.*
- 2016 *Chairman, Organizing Committee, 4th International Workshop on Nano-Particle Emissions from Heavy-Duty Vehicles. Haifa, June 21, 2016.*
- 2016 *Organizer and Chairman, Emissions session, 22nd SAE Small Engine Technology Conference SETC-2016, Charleston, USA, November 15-17, 2016.*
- 2016 *Organizer and Chairman, Propulsion Systems & Vehicle Engineering sessions, The 34th Israeli Conference on Mechanical Engineering – ICME 2016, Tel-Aviv, November 22-23, 2016.*

SPECIAL PROFESSIONAL ACTIVITIES

Reviewing and Refereeing

UNEP Intergovernmental Panel on Climate Change (IPCC); Measurement Science and Technology; Industrial & Engineering Chemistry Research; International Journal of Energy Engineering; Energy and Power; American Journal of Environmental Engineering; International Journal of Energy Research; International Journal of Traffic and Transportation Engineering; SAE Technical Papers; Energy; Environmental Science & Technology; Resources and Environment; Walailak Journal of Science and Technology; British Journal of Applied Science & Technology; Energy Efficiency; Journal of Mechanical Design and Vibration; Transport problems; Journal of Mechanical Engineering Research; International Journal of Vehicular Technology; Atmospheric Pollution Research; American Journal of Mechanical Engineering; International Journal of Hydrogen Energy; Fuel; International Journal of Vehicle Systems Modelling and Testing; Atmospheric Environment; SAE International Journal of Engines; International Journal of Chemical Engineering; Israel Ministry of Science, Technology and Space; Advances in Engineering Software; Catalysts; International Journal of Environment and Waste Management; Applied Energy

Invited lectures and courses (not at conferences)

1. L. Tartakovsky*, Internal combustion engines for combat vehicles, *Course of Lectures* invited by the Israeli Ministry of Defense, Tel-Aviv, August 2010.
2. L. Tartakovsky*, Motor vehicles fueled by natural gas – a potential of use in Israel, Israeli Ministry of National Infrastructures, Tel-Aviv, December 2010.

3. L. Tartakovsky*, Natural gas as automotive fuel – a potential of use in Israel, Israeli Institute of Energy and Environment, Tel-Aviv, April 2011.
4. L. Tartakovsky*, Heavy duty diesel engines for military applications – latest technology trends, Israeli Ministry of Defense, Yehud, May 2013.
5. L. Tartakovsky*, Combustion processes and pollutants formation in internal combustion engines, Lecture in the course on Air Quality and Climate Change, Israeli Ministry of Environment Protection, Tel-Aviv, February 2014.
6. L. Tartakovsky*, Diesel exhaust aftertreatment systems – implementation in in-use heavy-duty diesel vehicles, Lecture in the Seminar on Implementation of Orders for Reduction of Air Pollution by Heavy-Duty Vehicles, Israeli Ministry of Environment Protection, Tel-Aviv, November 30, 2014.
7. L. Tartakovsky*, Internal combustion engine fundamentals, Lecture in the course on Air Quality and Climate Change, Israeli Ministry of Environment Protection, Tel-Aviv, December 15, 2014.
8. L. Tartakovsky*, Internal combustion engines – fundamentals and technology trends, Israeli Ministry of Defense, Tel-Aviv, March 23 2015.
9. L. Tartakovsky*, Control and mitigation of pollutant emissions from road vehicles, Lecture in the course on Air Quality and Climate Change, Israeli Ministry of Environment Protection, Tel-Aviv, November 9, 2015.
10. L. Tartakovsky*, Combustion concepts of internal combustion engines, Lecture in the course on Air Quality and Climate Change, Israeli Ministry of Environment Protection, Tel-Aviv, November 9, 2015.

Formal seminars

1. L. Tartakovsky*, Assessment of emissions by motor vehicles using remote sensing technology, Bern University of Applied Sciences, Biel, Switzerland, March 2002.
2. L. Tartakovsky*, Drivers' exposure to air pollution inside a car, the Academic College Hadassah, Jerusalem, March 7, 2012.
3. L. Tartakovsky*, Engine waste heat recovery by thermo-chemical recuperation of exhaust gas heat, Ariel University, July 2013.
4. L. Tartakovsky*, High-pressure thermo-chemical recuperation for waste heat recovery of internal combustion engines, Department of Vehicle Engineering, Beijing Institute of Technology (BIT), Beijing, China, November 13, 2015.
5. L. Tartakovsky*, Waste heat recovery of internal combustion engine for high energy efficiency and ultra-low emissions, Department of Vehicles and Transportation Engineering, China Agricultural University, Beijing, China, November 13, 2015.
6. L. Tartakovsky*, High-pressure thermo-chemical recuperation for waste heat recovery in internal combustion engines, The Department of Mechanical Engineering, College of Engineering and Applied Sciences, Stony Brook University, USA, April 18, 2016.

Consulting activities

2015	Haifa District Municipal Association for Environmental Protection (Mitigation of pollutant emissions by heavy-duty municipal vehicles)
2013	Israeli Ministry of Energy and Water Resources, Kivun Ltd (Advanced vehicle propulsion systems)
1998 – present	Israeli Ministry of Environmental Protection (Pollutant emissions by motor vehicles)
2007 – present	MAFAT, Israeli Ministry of Defense (Performance analysis of UAV engines)
2010 - 2011	Aeronautics Defense Systems (Failure analysis of UAV engines)
2007 - 2009	Aeronautics Defense Systems (Cooling problems of UAV engines)
2009	Israeli Ministry of Defense (Performance analysis of tank engines)
2005 – 2007	Israeli Ministry of Defense (Failure analysis of tank engines)
2003	Israeli Ministry of Transportation (Smoke measurement procedure for Diesel engine vehicles)