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Israel Aerospace
Industries



Technion – Israel Institute of Technology
Faculty of Mechanical Engineering
Internal Combustion Engines Lab



10th Conference on Propulsion Technologies for Unmanned Aerial Vehicles

Conference Program

Thursday, February 16, 2023

Shirley and Manny Ravet Auditorium, D. Dan and Betty Kahn Building
Faculty of Mechanical Engineering, Technion, Haifa

8:30 – 9:00	Welcome and Registration
Opening session	Chairman: Leonid Tartakovsky, Technion
9:00 – 9:30	Welcome: Alon Wolf , Dean, Faculty of Mechanical Engineering, Technion Yigal Ben-Shabat , Head, Propulsion Branch, Directorate of Defense Research & Development, MAFAT Emanuel Liban , President, Association of Engineers, Architects and Graduates in Technological Sciences in Israel
9:30 – 10:00	Keynote lecture: Future Prospects of Green and Environmentally Friendly Fuels for UAV Applications Avinash Kumar Agarwal , Indian Institute of Technology Kanpur, India
Plenary session	Chairman: Yitzhak (Itche) Hochmann, Edmatech
10:00 – 10:30	Considerations for Propulsion System selection for UAV Emanuel Liban , Edmatech
10:30 – 11:00	Propulsion systems based on mechanical energy storage Eran Sher , Technion
11:00 – 11:30	Failure Analysis of a Hermes 450 Engine Cut due to a Faulty Thermostat Shai Zvulun, I. Kaparovsky, A. Zehavi-Cohen , Israel Air Force, IDF
11:30 – 11:50	Coffee break
Noon session	Chairman: Michael Shapiro, Technion
11:50 – 12:10	Feasibility of non-emission aviation propulsion system Jacob Feldman , IAI

12:10 – 12:30	Increasing Rotary Powerplant TBO & MTBO - The Road To 1000 Operating Hours <i>Guy Ben-Haim</i> , Elbit Systems UEP
12:30 – 12:50	Hybrid propulsion system concepts for tactical UAVs <i>Itay Lowental</i> , Lowental Hybrid
12:50 – 13:05	Best Student Poster Award Ceremony
13:05 – 14:20	Lunch
Afternoon session	Chairman: Nir Geva, Elbit Systems
14:20 – 14:40	A novel ultra-high efficiency hybrid cycle combining a fuel cell, internal combustion engine and thermochemical recuperation of the waste heat <i>David Diskin and Leonid Tartakovsky</i> , Technion
14:40 – 15:00	Engine Testing at Low Temperatures - Review and Practical Observations <i>Hanan Kapara</i> , Elbit Systems UEP
15:00 – 15:20	300W Micro Gas Turbines towards Enhancing Endurance of Unmanned Aerial Vehicle Applications <i>Lukas Badum, Pavel Kovalyov, Salman Nbwani, Beni Cukurel</i> , Technion
15:20 – 15:40	Water recuperation for a fixed-wing drone powered by on-demand hydrogen generator with fuel cell <i>Lev Zakhvatkin, Alex Schechter and Idit Avrahami</i> , Ariel University
Afternoon session	Chairman: Shaul Eliahou-Niv, Israel Aerospace Industries
14:20 – 14:40	Testing of reciprocating engines at simulated high-altitude conditions <i>Rony Yacoel</i> , IAI
14:40 – 15:00	UAS Fuel system design considerations and P.O.D <i>Michael Ayzenberg</i> , Aeronautics
15:00 – 15:20	Performance enhancement of a Wankel Engine through numerical simulation <i>Shimon Pisnoy, Steven Frankel and Leonid Tartakovsky</i> , Technion
15:20 – 15:40	Numerical Thermal Analysis of Cryo-adsorbed hydrogen storage system for airborne applications <i>Daniel Tsukerman and Nir Tzabar</i> , Ariel University
15:40 – 16:00	Coffee break
Panel session	Development trends in UAV Propulsion – where and when?
16:00 – 16:30	Moderator: Jacob Feldman, Israel Aerospace Industries Panelists: E. Sher (Technion), E. Liban (Edmatech), Y. Ben-Shabat (MAFAT), N. Geva (Elbit Systems), I. Biner (Aeronautics)
Closing remarks	Leonid Tartakovsky, Chairman Organizing Committee

16:30 – 16:35	
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* The Program is subject to changes

Conference language – English

An exhibition will take place in the Conference lobby, where the leading industries will demonstrate their latest developments in the field of UAV propulsion.

Participation in the Conference is free of charge, however early registration is required (through the link: <https://forms.gle/GEBjppqptcHcTgmL9>) .

Conference Chairman:

*Leonid Tartakovsky, Faculty of Mechanical Engineering, Technion – Israel Institute of Technology.
Email address: tartak@technion.ac.il*

Conference Secretary:

Ms. Shimrit Wagner-Lior, shimrit.w@me.technion.ac.il Phone: +972-77-8871668, Fax: +972-4-8295710

Best Student Poster Selection Committee:

Emanuel Liban, Israel Society of Mechanical Engineers – *Chairman*

Idan Biner, Aeronautics

Lena Jilin, IDF

Jacob Feldman, Israel Aerospace Industries

Yitzhak (Itche) Hochmann, Edmatech

Nir Geva, Elbit Systems

Itay Lowental, Lowental Hybrid

Michael Shapiro, Technion

Eran Sher, Technion

Posters session

1. **Daniel Tsukerman**, Nir Tzabar: Thermal management of Cryo-adsorbed hydrogen storage system. The Department of Mechanical Engineering & Mechatronics, Ariel University.
2. **Michael Palman, Yohai Abraham**, Beni Cukurel: Additively Manufactured Incessantly Printed Engines. Faculty of Aerospace Engineering, Technion.
3. **Denis Buntin**, Leonid Tartakovsky: Multi-stage heat release of polyoxymethylene dimethyl ether 1 (PODE1). Faculty of Mechanical Engineering, Technion.
4. **Asher Netzer-Lichinitzer**, Leonid Tartakovsky: An advanced injector for direct injection of a hydrogen-rich reformat into an IC engine cylinder. Faculty of Mechanical Engineering, Technion.
5. **Sharon Goldstein**: Development of autonomous driving technology for the Technion Formula-Student racecar, Technion.
6. **Doron Spiegel, Bar Turgeman**: Development of an electric powertrain for the Technion Formula-Student racecar, Technion.
7. **Majd Jaraysi, Ayham Abu Eid**: The world-lightest Formula-Student Technion racecar, Technion.
8. Boris Arav: Determination of basic parameters of unmanned aerial vehicles (UAVs) based on constructal law of design and evolution. Community of scientists and experts "RHV", Rehovot.
9. **Galia Faingold, Omer Kalitzky**, Joseph Lefkowitz: Plasma reforming of renewable ammonia mixtures for zero-carbon energy utilization. Faculty of Aerospace Engineering, Technion.
10. **Eyal Hayouk, Ofek Rapaport and Moshe Dery**, Idit Avrahami: Dual-Cycle Hydrogen Generator with a Water Feeding for Fuel-cell derived Ariel vehicles. Biomechanics center, Ariel University.
11. **Mordechai Kremer, Ofir Boaron, Nevo Levi**, and Idit Avrahami: On-demand Hydrogen Generator for Fuel-cell derived Marine vehicles. Department of Mechanical Engineering and Mechatronics, Ariel University.
12. **Avinash Kumar, Yosef Schrader** and Idit Avrahami: Miniature and Light Energy Pack based on Hydrolysis with Atmospheric Humidity. Department of Mechanical Engineering and Mechatronics, Ariel University.
13. **Ben Binyamin Ben David Holtzer** and Leonid Tartakovsky: Underexpanded Impinging Gaseous Jet Interaction with a Lubricated Cylinder Surface. Faculty of Mechanical Engineering, Technion.
14. **Dror Tapiero¹, David Diskin¹**, Nir Tzabar² and Leonid Tartakovsky¹: Performance of a Solid-Oxide Fuel Cell Fed by Methanol Steam Reforming Products. 1 - Faculty of Mechanical Engineering, Technion; 2 - The Department of Mechanical Engineering & Mechatronics, Ariel University.
15. Oleg Gaspar: Compact UAV hybrid propulsion system considerations from the point of view of an ICE engineer.
16. **Mordechay Buzaglo**, Yoel Tenne: Airfoil Shape Optimization by Dimensionality-Reduction assisted Machine-Learning. Department of Mechanical Engineering & Mechatronics, Ariel University.

A posters session will be open for audience during the whole Conference day. Poster presenters will make a 2-min presentation of their work. Three best student posters will be awarded by

certificates and prizes of 1500, 1000 and 500 NIS for the 1st, 2nd and 3rd places, respectively donated by **Association of Engineers, Architects and Graduates in Technological Sciences in Israel.**