# 8th Conference on Propulsion Technologies for Unmanned Aerial Vehicles

## Conference Program

**Thursday, January 31, 2019**  
Shirley and Manny Ravet Auditorium, D. Dan and Betty Kahn Building  
Faculty of Mechanical Engineering, Technion, Haifa

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
<th>Title</th>
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<tr>
<td>8:30 – 9:00</td>
<td>Welcome and Registration</td>
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| 9:00 – 9:30 | Opening session | Chairman: Leonid Tartakovsky, Technion | Welcome: Anath Fischer, Deputy Executive Vice President for Research, Technion  
Oleg Gendelman, Dean, Faculty of Mechanical Engineering, Technion  
Yigal Ben-Shabat, Head, Propulsion Branch, Directorate of Defense Research & Development, MAFAT  
Emanuel Liban, Chairman, Israel Society of Mechanical & Aerospace Engineers |
| 9:30 – 10:00 | Keynote lecture |  | Future engine fuels and their implications  
Jaal Ghandhi, Chairman, Department of Mechanical Engineering, University of Wisconsin-Madison, USA |
| 10:00 – 10:30 | Plenary session 1 | Chairman: Yitzhak (Itche) Hochmann, Edmatech | Using advanced batteries for propulsion: scope of options  
Doron Aurbach, Bar-Ilan University |
| 10:30 – 11:00 |  |  | Research Activities, Challenges, and Future Directions in UAV Propulsion  
Michael Kass, Fuels and Engines Group, Oak Ridge National Laboratory, USA |
| 11:00 – 11:30 |  |  | Coffee break |
| 11:30 – 12:00 | Plenary session 2 | Chairman: Michael Shapiro, Technion | Guide to design of efficient UAV propulsion  
Emanuel Liban, CEO, Edmatech, Israel |
| 12:00 – 12:20 |  |  | High Power Density High Efficiency Mechanically Assisted Turbocharged Direct Injection Jet Ignition Engines for Unmanned Aerial Vehicles  
Albert Boretti, Independent Scientist, Australia |
| 12:20 – 12:45 |  |  | UAV propulsion from the viewpoint of an operator  
G. Sheffy, Israel Air Forces, IDF, Israel |
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<tr>
<th>Time</th>
<th>Session</th>
<th>Chairman</th>
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<tr>
<td>12:45 – 12:55</td>
<td>Best Student Poster Award Ceremony</td>
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<td>12:55 – 14:00</td>
<td>Lunch</td>
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<td>14:00 – 14:20</td>
<td>Session &quot;New Concepts &quot;</td>
<td>Ariel Dvorjetski, IDF</td>
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<td>14:00 – 14:20</td>
<td>In-Cylinder Steam Reforming in UAV Diesel Engines</td>
<td>Ilai Sher¹, Eran Sher², 1 – Ontario, Canada; 2 - Technion, Israel</td>
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<td>14:20 – 14:40</td>
<td>Laser Energy Transfer – Preliminary Experimental Results</td>
<td>Igor Gerlovin, Israel Aerospace Industries</td>
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<td>14:40 – 15:00</td>
<td>High-pressure thermochemical recuperation of exhaust gas energy in internal combustion engines</td>
<td>Arnon Poran¹,², Leonid Tartakovsky³, 1 – Rafael, 2 – Technion, Israel</td>
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<tr>
<td>14:00 – 14:20</td>
<td>Session &quot;Engine Design &amp; Performance – 1&quot;</td>
<td>Jacob Feldman, Israel Aerospace Industries</td>
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<tr>
<td>14:00 – 14:20</td>
<td>The Elbit Systems 903 Next Generation Rotary Engine: From Simulation to Prototype</td>
<td>Guy Ben-Haim, Nir Geva, Elbit Systems, Israel</td>
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<td>14:20 – 14:40</td>
<td>Performance comparison of a direct-injection ICE in diesel and spark-ignition operation with methanol reforming products</td>
<td>Andy Thawko, Leonid Tartakovsky, Technion, Israel</td>
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<td>14:40 – 15:00</td>
<td>Mechanisms of rotational speed control for propellers with a constant pitch</td>
<td>Aviv Turgeman, Aeronautics, Israel</td>
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<td>15:00 – 15:20</td>
<td>Coffee break</td>
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<td>15:20 – 15:40</td>
<td>Session &quot;Alternative Propulsion Technologies&quot;</td>
<td>Igor Gerlovin, Israel Aerospace Industries</td>
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<td>15:40 – 16:00</td>
<td>CFD simulation of ethanol steam reforming for external combustion engine</td>
<td>Alon Davidy, TOMER Co., Israel</td>
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<td>16:00 – 16:20</td>
<td>Maintenance of electric propulsion systems</td>
<td>Erez Mosafi, Ledico – Bosch, Israel</td>
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<td>15:20 – 15:40</td>
<td>Session &quot;Engine Design &amp; Performance – 2&quot;</td>
<td>Benjamin Brinder, IDF</td>
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<tr>
<td>15:20 – 15:40</td>
<td>Propulsion System Availability Improvement by Advanced Health Monitoring Techniques</td>
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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 (email to shimrit.w@me.technion.ac.il).

**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
Daniel Budianu, Israel Aerospace Industries
Ariel Dvorjetski, IDF
Jacob Feldman, Israel Aerospace Industries
Yitzhak (Itche) Hochmann, Edmatech
Nir Geva, Elbit Systems
Michael Shapiro, Technion
**Posters session**

1. Numerical Simulation and Parametric Investigation of Boron Loaded Gel Fuel Ramjet  
   David Diskin, Benveniste Natan, Technion - IIT, Israel.

2. HCCI Combustion Process Management in ICE with TCR by Control of the Methylal Reforming Products Composition  
   D. Buntin, L. Tartakovsky, Technion – IIT, Israel

3. Pump Based Hydrogen Generator  
   Michael Zolotih, Lev Zakhvatkin, Idit Avrahami, Alex Schechter, Ariel University, Israel

4. Storage ageing of grease in sealed-for-life high speed rolling bearings  
   Y. Kligerman, H. Kasem and M. Varenberg, 1 – Technion – IIT, Israel; 2 - Azrieli College of Engineering, Jerusalem, Israel; 3 - Georgia Institute of Technology, USA

5. Optimization of Parameters of Internal Combustion Engine  
   A.L. Zhmudyak, L.M. Zhmudyak, Technion - IIT, Israel; 1 - Octopol, Israel; 2 - Rehovot, 7645501, Israel

6. Intake system for Formula SAE engine  
   Y. Kuhr, I. Barbul, Technion - IIT, Israel

7. Cooling system for Formula SAE engine  
   L. Finkelman, I. Barbul, Technion - IIT, Israel

8. Fuel system for Formula SAE engine  
   Y. Boim, I. Barbul, Technion - IIT, Israel

9. Controlled Radical Production by Non – Thermal Plasma  
   Nir Druker, Gideon Goldwine, Barry Greenberg, Eran Sher, Technion - IIT, Israel

10. A New Modified Diesel Cycle for Small Aircraft Operating at High Altitude Conditions – A Numerical Simulation  
    Kadmiel Karsenty, Eran Sher, Technion - IIT, Israel

11. Reforming-Controlled Compression Ignition  
    Amnon Eyal, Leonid Tartakovsky, Technion - IIT, Israel

12. The benefits of Inverted Brayton cycle and Concept for CHP plants based on Low-Power Micro Turbine Generators  
    Boris Arav, Y. Sizov, 1 – TurboGEN Tech., 2 – Afeka College, Israel

13. Particle emission characteristics of an ICE fed with hydrogen rich-reformate  
    H. Yadav, A. Thawko, M. Shapiro, and L. Tartakovsky, Technion - IIT, Israel

* The Posters Session Program is subject to changes

** A posters session will be open for audience during the whole Conference day. Poster presenters will make a 2-min presentation of their work at 08:00. 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 the Association of Engineers, Architects and Graduates in Technological Sciences in Israel.