IACAS-2024 Program - Table of Content

Thursday 9.5.2024			Technion, Haifa	
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	8:45-12:00			
	Welcoming Address: Prof. Uri Sivan, Technion President		Churchill Hall	
	Conference Opening: Prof. Dan Blumberg, Chair IACAS-2024			
ThPl1	**Prof. Colin Price**			
	Coffee Break 9:45-10:15			
ThPl2	**Dr. Raz Itzhaki**			
ThPl3	**Space Startups Panel**			
	Lunch 12:15-13:30			
	13:30-15:30			
ThL1T1	Guidance, Navigation and Control I		A	
ThL1T2	Fluid Mechanics		B	
ThL1T3	Aerospace Design and Manufacturing		C	
ThL1T4	Tutorial Session: Hamiltonian Mechanics and Power Geometry Tools in Space Mechanics and Astrodynamics		D	
ThL1T5	Aerodynamics & Aeroacoustics		E	
ThL1T6	Aeroelasticity & Fluid-Structure Interaction		F	
ThL1T7	Propulsion and Combustion		G	
	Coffee Break 15:30-16:00			
	16:00-18:00			
ThL2T1	Guidance, Navigation and Control II		A	
ThL2T2	Flow Control and CFD		B	
ThL2T3	Aerospace Design, Manufacturing and Multi-Disciplinary Optimization		C	
ThL2T4	Data, AI and Autonomy		D	
ThL2T5	Aerodynamics, Hydrodynamics and Aeroacoustics		E	
ThL2T6	Astrodynamics and Space Systems		F	
ThL2T7	Solid Mechanics		G	

IACAS

Space Startups Session

Join us for an engaging panel discussion showcasing Israeli startups at the forefront of the space industry. Discover the innovative technologies and groundbreaking ideas emerging from Israel's entrepreneurial ecosystem as experts delve into topics ranging from satellite technology and space exploration to commercial space ventures. Gain insights into how these startups are shaping the future of space innovation and advancing global space capabilities. Whether you're a space enthusiast, investor, or industry professional, this event promises to inspire and inform you about the exciting developments in Israel's space startup landscape.

THE SPACE STARTUPS PANELISTS:

- Mr. Alex Pospekhov, CEO Mission Space

- Mr. Yigal Harel, Co-Founder & CTO at WeSpace Technologies

- Prof. Meir Ariel, Head of the Tel Aviv University New Space Center on the TEVEL Project

- Dr. Noam Leiter, CEO LulavSpace

ThL1T1 — Hall A

Guidance, Navigation and Control I

Chair:

13:30-13:45	ThL1T1.1

Reachability-Based Delayed Decision Guidance for Conventional Interceptors

Vitaly Shalumov	Technion
Gleb Merkulov	Technion
Tal Shima	Technion

13:45-14:00	ThL1T1.2

Guidance on Stationary Target with Range-Rate Information Only

| Liat Peled-Eitan | RAFAEL |
| Ilan Rusnak | RAFAEL |

14:00-14:15	ThL1T1.3

Attitude Quaternion Estimation from Two Vector Observations

| Daniel Choukroun | Ben-Gurion University of the Negev |
| Caitong Peng | Ben-Gurion University of the Negev |

14:15-14:30	ThL1T1.4

GNSS Spoofing Observed in Israel Using Wideband RF Data and Software Radio

| Mark Psiaki | Virginia Tech |
| Alex Frid | Technion |

14:30-14:45	ThL1T1.5

Altruistic Kalman Filtering

Ronny Shapiro	Technion
Yuval Aldema-Tshuva	Technion
Nitai Stein	Rafael
Yaakov Oshman	Technion

14:45-15:00	ThL1T1.6

Bearing-only Formation Control with Directed Sensing

| Jiacheng Shi | Technion |
| Daniel Zelazo | Technion |

15:00-15:15	ThL1T1.7

Cooperative Guidance for Simultaneous Interception Using Multiple Sliding Surfaces

Maximillian Fainkich   Technion
Tal Shima   Technion

15:15-15:30	ThL1T1.8

Adjoint Differentiation Method for Trajectory Simulations with Terminal Conditions

Amir Mittelman   The University of Queensland
Gollan Rowan   The University of Queensland
Ingo Jahn   The University of Queensland

Fluid Mechanics

Chair:

| 13:30-13:45 | ThL1T2.1 |

Sensitivity of Flows Over Three-Dimensional Swept Wings at Low Reynolds Number

Anton Burtsev	University of Texas at Austin
Vojtech Pezlar	Czech Technical University in Prague
Vassilis Theofilis	Technion

| 13:45-14:00 | ThL1T2.2 |

Linear Stability of Compressible Flows in Open-Cavities with Curved Downstream Walls

Vojtech Pezlar	Czech Technical University in Prague
Kamil Dylewicz	University of Liverpool
Vassilis Theofilis	Technion

| 14:00-14:15 | ThL1T2.3 |

Investigation of Global Instabilities on Rotex-T Cone-Flare Geometry

| Kamil Dylewicz | University of Liverpool |
| Vassilis Theofilis | Technion |

| 14:15-14:30 | ThL1T2.4 |

Investigation Of Near-Wall Scatter of Scaled Inflectional Mean Velocity Profiles of Turbulent Separated Flow Over The Gaussian Bump

| Eric Vaizman | Technion |
| Igal Gluzman | Technion |

| 14:30-14:45 | ThL1T2.5 |

The Initial Stages of a Pressurized Hydrogen Jet Release: Analysis via High-Fidelity Numerical Simulations

Odie Nassar	Tel Aviv University
Moran Ezra	Tel Aviv University
Marcel Martins Alves	Tel Aviv University
Sergey Kudriakov	Université Paris-Saclay
Etienne Studer	Université Paris-Saclay
Liel Ishay	NRCN

Yoram Kozak	Tel Aviv University
14:45-15:00	ThL1T2.6

Kinetic Description of Flow Detachment At a Micro-Step

Din Ben-Adva	Technion
Giorgos Tatsios	University of Edinburgh
Avshalom Manela	Technion

15:00-15:15	ThL1T2.7

On Instabilities of Entropy-Layers in Compressible Flow

iliya milman	Technion
Michael Karp	Technion

15:15-15:30	ThL1T2.8

Deep Learning with Graph Neural Networks for Compressible Turbulent Flow

Peleg Levin	Rafael

ThL1T3   Hall C

Aerospace Design and Manufacturing

Chair:

13:30-13:45	ThL1T3.1

The Dream Chaser Re-Entry Space Vehicle Actuation System

Ilan Berlowitz	IBAero

13:45-14:00	ThL1T3.2

Boeing 737NG Hydrogen Fuel Cell Taxi System

Ilan Berlowitz	IBAero

14:00-14:15	ThL1T3.3

Transport Aircraft Cabin Air Quality Improvement

Ilan Berlowitz	IBAero

14:15-14:30	ThL1T3.4

A Data-Driven Strategy for Minimizing Parts Count in Aircraft Design

Yuval Freed	Israel Aerospace Industries
Maoz Koren	Israel Aerospace Industries

14:30-14:45	ThL1T3.5

Numerical Prediction of Stringer De-Bonding in Composite Stiffened Panels Subjected to Combined Loading

David Bardenstein	Israel Aerospace Industries
Iddo Kressel	Israel Aerospace Industries
Alexander Lukatsky	Israel Aerospace Industries

14:45-15:00	ThL1T3.6

An Open Source Quadcopter Platform for Simulink

Joseph Attias	Technion
Yael Marciano	Technion
Ruslan Arhipov	Technion
Daniel Zelazo	Technion

15:00-15:15	ThL1T3.7

Real-Time Health Monitoring of Aeronautical Structures via Sensitivity Tests Utilizing Principal Component Analysis

Yoav Ofir	Israel Aerospace Industries
Uri Ben Simon	Israel Aerospace Industries
Shay Shoham	Israel Aerospace Industries
Iddo Kressel	Israel Aerospace Industries
Jonathan Bohbot	Tel Aviv University
Moshe Tur	Tel-Aviv University

15:15-15:30	ThL1T3.8

'Smart Wing' Flight Demonstration of a Novel Composite Wing With Embedded Electronics and Sensing Capabilities

Erez Zemel	Rafael

Tutorial Session: Hamiltonian Mechanics and Power Geometry Tools in Space Mechanics and Astrodynamics

Moderators:
Vladimir Martinusi – Technion
Alexander Batkhin – Technion

13:30-14:15	ThL1T4.1

A Brief Introduction to Hamiltonian Formalism Applied in Astrodynamics

14:15-14:45	ThL1T4.2

Power Geometry Techniques for Hamiltonian Systems

14:45-15:30	ThL1T4.3

Applications: Small Periodic Non-Conservative Perturbations

ThL1T5 — Hall E

Aerodynamics & Aeroacoustics

Chair:

13:30-13:45	ThL1T5.1

On the Performance and Longitudinal Stability of Custer Channel Wing (CCW)

Moshe Zilberman — Azrieli Academic College of Engineering

13:45-14:00	ThL1T5.2

Integrating Ultrasonic and Photonic Forces

Ariel Sharon — Technion
Yeshayahou Levy — Technion

14:00-14:15	ThL1T5.3

Towards Low Distortion Airborne Optical Turrets: Leveraging Computational Aero-Optics and Data-Science Methods

Michael Weidenfeld — Elbit
Ori Haber — Elbit

14:15-14:30	ThL1T5.4

Experimental Study of the Side-Edge Vortex System on a Supercritical Wing Model

Hadar Ben-Gida — Technion
Satoshi Baba — University of Toronto
Philippe Lavoie — University of Toronto

14:30-14:45	ThL1T5.5

Aeroacoustic Characterization of a High-Lift Multi-Element Configuration

Hadar Ben-Gida — Technion
Marinus Okoronkwo — University of Toronto
Dominic Geneau — University of Toronto
Philippe Lavoie — University of Toronto

14:45-15:00	ThL1T5.6

Comparison of Traditional Acoustics and Psychoacoustics Analysis of a Rotor in Hover

Aleksandra Kvurt	Israel Aerospace Industries
Aharon Karon	Israel Aerospace Industries
Danny Abramov	Israel Aerospace Industries
Shai Alexandroni	Technion

15:00-15:15	ThL1T5.7

Drastic reduction of Cavity Flow Pressure Oscillations at Supersonic Speed by Modifying its Rear Face into an Ellipse shape

Jacob Cohen	Technion
Soumya Ranjan Nanda	Technion
Sudip Das	Birla Institute of Technology Mesra
S. K. Karthick	Indian Institute of Technology Hyderabad

15:15-15:30	ThL1T5.8

Classifying Structure and Air Borne Noise Pathways in Urban Structures Subjected to Subsonic Wind Flow

Saar Golan	Dynamica Design

Aeroelasticity & Fluid-Structure Interaction

Chair:

13:30-13:45	ThL1T6.1

Preliminary Structural Design Tool for Flexible Slender Bodies With Aeroelastic Constraints

Yaara Karniel	Technion
Daniella Raveh	Technion

13:45-14:00	ThL1T6.2

Flutter and Post-Flutter Response of Plates with Acoustic Cavity Coupling

Maxim Freydin	Technion

14:00-14:15	ThL1T6.3

Hypersonic Vehicle Aeroelasticity Research Using Ansys Aerodamping Workflow

Dvir Mendler	Ansys
Konstantinos Giannokostas	Ansys

14:15-14:30	ThL1T6.4

Flight-Dynamics Aeroelastic Coupling of Flexible and Very Flexible Wings

Dor Naftaly	Israeli Air Force
Daniella Raveh	Technion

14:30-14:45	ThL1T6.5

Wind-Tunnel Investigation of the F-16 Transonic Buffet Phenomenon

Tzlil Nahom Jidovetski	Israeli Air Force
Michael Iovnovich	Israeli Air Force
Daniella Raveh	Technion

14:45-15:00	ThL1T6.6

Inducing Failure of an Aluminum Structure Using an Explosive-Filled Expanding Tube

Lev Misiuk	Israel Aerospace Industries
Tal Lahav	Israel Aerospace Industries
Ori Shnitman	Israel Aerospace Industries
Ilan Weissberg	Israel Aerospace Industries

15:00-15:15	ThL1T6.7

Flutter Control of A Symmetric Wing Using Active Flow Control

Shay Monat	Tel Aviv University
Oksana Stalnov	Technion

15:15-15:30	ThL1T6.8

Design, Numerical and Experimental Investigation of Wing With a Morphing Aileron Section

Gali Alon Tzezana	Rafael
Gal Doron	Rafael
Valentin Nov	Rafael
Avishay Kidron	Rafael

ThL1T7   Hall G

Propulsion and Combustion

Chair:

13:30-13:45	ThL1T7.1

Dynamic Testing of Underwater Hybrid Ram Rockets

Sagi Dinisman	Technion
Nachum Eisen	Israel Aerospace Industry
Alon Gany	Technion

13:45-14:00	ThL1T7.2

An Exploration of Wall-Based Ignition Using Nanosecond-Pulsed High-Frequency Discharges

| Weronika P. Senior-Tybora | Technion |
| Joseph Lefkowitz | Technion |

14:00-14:15	ThL1T7.3

Dual Mode Scramjet Operation and Engine Unstart

| Eran Arad | Technion |
| Ido C. Ruhman | Technion |

14:15-14:30	ThL1T7.4

Pulse Detonation Ignition of n-Dodecane Spray and Air Mixtures

| Hertzel Kadosh | Technion |
| Dan Michaels | Technion |

14:30-14:45	ThL1T7.5

Modular Modelling Approach for Efficient Gradient Evaluation of a Low-Order Integrated Scramjet Propulsion System

Amir Mittelman	The University of Queensland
Kieran Mackle	The University of Queensland
Ingo Jahn	The University of Queensland
Gollan Rowan	The University of Queensland

14:45-15:00	ThL1T7.6

Helical Hybrid Engine Operating in a Blowdown Regime, Technion Rocketry Club

Ethan Loskove   Technion

15:00-15:15	ThL1T7.7

**Investigation of Radial Inward Porous Inert Media Combustors
for Ammonia-Air Combustion**

Guguloth Mahesh Nayak   Technion
Silky Elanjickal   Technion
Beni Cukurel   Technion
Joseph Lefkowitz   Technion

ThL2T1   **Hall A**

Guidance, Navigation and Control II

Chair:

16:00-16:15   **ThL2T1.1**

Application of the Riccati Inequality to Design a Controller for Stabilization of Nonlinear Affine System

Gyorgy Hexner	Rafael
Ilan Rusnak	Rafael

16:15-16:30   **ThL2T1.2**

Nonlinear Control of an Air-Breathing Hypersonic Vehicle Subject to Scramjet Engine Constrains

Ofir Vaknin	Technion
Moshe Idan	Technion

16:30-16:45   **ThL2T1.3**

Novel Class of Expected Value Bounds and Applications in BSP

Ohad Levy-Or	Technion
Vadim Indelman	Technion

16:45-17:00   **ThL2T1.4**

Simplified Continuous High Dimensional Belief Space Planning with Adaptive Probabilistic Belief-dependent Constraints

Andrey Zhitnikov	Technion
Vadim Indelman	Technion

17:00-17:15   **ThL2T1.5**

Robustness of the SDC Based Quadratic Optimal Control of Nonlinear Systems

Maital Levy	Technion
Ilan Rusnak	Rafael

17:15-17:30	ThL2T1.6

Model-Based Mesh Generation for Orthogonal Collocation Transcription

Ilan Taub — Technion
Vitaly Shaferman — Technion
Joseph Z. Ben-Asher — Technion

17:30-17:45	ThL2T1.7

A Deterministic Search Approach for Solving Stochastic Drone Search and Rescue Planning Without Communications

Evgeny Mishlyakov — Technion
Mikhail Gruntov — Technion
Alexander Shleyfman — Bar-Ilan University
Erez Karpas — Technion

17:45-18:00	ThL2T1.8

Planning and Acting While the Clock Ticks

Erez Karpas — Technion

ThL2T2   Hall B

Flow Control and CFD

Chair:

16:00-16:15	ThL2T2.1

Input-Output Approach for Modeling Flow Response to Actuation in Transitional Boundary Layer

| Ofek Frank-Shapir | Technion |
| Igal Gluzman | Technion |

16:15-16:30	ThL2T2.2

Energy-efficient Application of Suction and Pulsed Blowing as an Alternative to a Leading Edge Slat

Shay Monat	Tel Aviv University
Asaf Kor	Tel Aviv University
Avi Seifert	Tel Aviv University
Oksana Stalnov	Technion

16:30-16:45	ThL2T2.3

Closed-Loop Stall Control using DBD-Plasma-Actuation

| Mordechai Garcia | Technion |
| David Greenblatt | Technion |

16:45-17:00	ThL2T2.4

Computational and Experimental Lift Enhancement Study Applied to Wind Turbine Airfoil

| Asaf Kor | Tel Aviv University |
| Avi Seifert | Tel Aviv University |

17:00-17:15	ThL2T2.5

Effect of Krylov Solver on Dual-Time Stepping Convergence

Yakov Mindelis — Israeli CFD Center
Ilya Kislitsin — Israeli CFD Center
Yuval Levy — Israeli CFD Center

17:15-17:30	ThL2T2.6

Improved Modeling of Vibrational Non-Equilibrium Effects on Turbulence for Hypersonic Applications

Sawan S Sinha — Indian Institute of Technology Delhi
Shishir Srivastava — Indian Institute of Technology Delhi

Aerospace Design, Manufacturing and Multi-Disciplinary Optimization

Chair:

16:00-16:15	ThL2T3.1

Hybrid 3D-1D Finite Element Modeling for Elastodynamic Bending: Preliminary Results

Yana Mayorov	Technion
Daniel Rabinovich	Technion
Dan Givoli	Technion

16:15-16:30	ThL2T3.2

Composite Grid Structure with Embedded Fiber Optic Sensing Capability

Ilan Weissberg	Israel Aerospace Industries
Daniel Arviv	Israel Aerospace Industries
Nir Lalazar	Israel Aerospace Industries
Giovanni Totaro	CIRA - Italian Aerospace Research Center
De Nicola Felice	CIRA - Italian Aerospace Research Center
Giusto Giovangiuseppe	CIRA - Italian Aerospace Research Center
Spena Paola	CIRA - Italian Aerospace Research Center

16:30-16:45	ThL2T3.3

Optimization of Aircraft Stringer Reinforcements

Steve Katzeff	Israel Aerospace Industries

16:45-17:00	ThL2T3.4

Isogrid Composite Structure from Design to Production

Olga Polovinets	Rafael

17:00-17:15	ThL2T3.5

Matlab Interpolation of Planar Curves with Non-Monotonic Independent Variables

Baruch E. Karlin

17:15-17:30	ThL2T3.6

Identification of an Elastic Inclusion Using a Time-Dependent Adjoint Method

Amit Sayag   Technion
Dan Givoli   Technion

17:30-17:45	ThL2T3.7

Hourly Scale Model of Wind Magnitude and Direction Based on Stochastic Differential Equations

Maayan Shimoni   Technion
Anna Clarke   Technion

ThL2T4   Hall D

Data, AI and Autonomy

Chair:

16:00-16:15	ThL2T4.1

AI-Empowered Resilient Quadrotor Navigation

Itzik Klein	University of Haifa

16:15-16:30	ThL2T4.2

Anomaly Detection in Structural Vibration-Tests through Machine-Learning Processes on Accelerometer Measurements

Shiran Tsolker	Rafael
Shahar Yehezkel	Rafael
Ido Hauzer	Technion
Ariel Drachinsky	Rafael

16:30-16:45	ThL2T4.3

Machine Learning Optimization of Support Jigs for Freighter Conversion

Maoz Koren	Israel Aerospace Industries
Yuval Freed	Israel Aerospace Industries
Boris Dorfman	Israel Aerospace Industries
Yana Geras	Technion

16:45-17:00	ThL2T4.4

Efficient Aerodynamic Database Construction: Leveraging Sparse Sensing and Machine Learning

Michael Weidenfeld	Elbit
Shimon Julius	Elbit

17:00-17:15	ThL2T4.5

Deep Compression of Neural Networks for Optimal Control Applications

Johannes Diepolder	Technical University of Munich
Joseph Z. Ben-Asher	Technion

17:15-17:30	ThL2T4.6

Asynchronous Sampled-Data Synchronization with Small communication Delays

Gal Barkai	Technion
Leonid Mirkin	Technion
Daniel Zelazo	Technion

17:30-17:45	ThL2T4.7

GAIA–Generative AI for Aerospace

Aviv Fried	Israel Aerospace Industries
Erez Sharon	Israel Aerospace Industries

17:45-18:00	ThL2T4.8

A Lecture on Smart Maintenance

Keren Liadski	Israel Aerospace Industries

IACAS

Aerodynamics, Hydrodynamics and Aeroacoustics

Chair:

16:00-16:15	ThL2T5.1

Modified Pattern Free-Surface Synthetic Schlieren for Non-Uniformly Strained Liquid Surface

Hillel Mermelstein	Technion
Yuval Dagan	Technion

16:15-16:30	ThL2T5.2

Iterative Abel Inversion Procedure for Noisy Signals

Victor Chernov	Braude

16:30-16:45	ThL2T5.3

Assessment of Rotor Tonal Noise in the Time and Frequency Domains with Small in Diameter Propellers

Asaf Kor	Tel Aviv University
Oksana Stalnov	Technion

16:45-17:00	ThL2T5.4

Investigation of Lift Coefficient Models and Unsteady Phenomenon During Pitching Motion

Naama Aliskevicius	Technion
Oksana Stalnov	Technion

17:00-17:15	ThL2T5.5

Topology Based Multi-Fluid Flow Model

Ido Silverman	Soreq - NRC

17:15-17:30	ThL2T5.6

Computer Vision Algorithms Application for Tracking and Characterization of Bubble Breakup Dynamics in the Nozzle Flow of Multicomponent Liquids

Samuel Gabison	Technion
Igal Gluzman	Technion

17:30-17:45	ThL2T5.7

Computer Vision Algorithms Application for the Characterization of Bubbly Shock-Wave Morphology and Their Coupled Interactions with Bubbles in Aerated Cavitating Flow

Elad Zur	Technion
Igal Gluzman	Technion

17:45-18:00	ThL2T5.8

Development of a Thermoelectric Energy Harvesting System Integrated with a Phase Change Material Heat Sink

Daniel Jalontzki	Tel Aviv University
Moshe Bukai	Soreq Nuclear Research Center
Yoram Kozak	Tel Aviv University

Astrodynamics and Space Systems

Chair:

16:00-16:15	ThL2T6.1

Analytical Dynamics Within Rotating Frames: Addressing the Keplerian Ballistic Problem

| Iris Kanter | Technion |
| Vladimir Martinusi | Technion |

16:15-16:30	ThL2T6.2

Employing Intermediate Points for Optimal Low-Thrust Docking with a Constrained Approach Direction

| Or Nahum | Technion |
| Vitaly Shaferman | Technion |

16:30-16:45	ThL2T6.3

Long-Term Mitigation of Earth Oblateness Effects on Large Aperture Satellite Constellations

| Vladimir Martinusi | Technion |
| Ilay Lazarovich | Technion |

16:45-17:00	ThL2T6.4

Integration of FOS for Health Monitoring of Composite High-Pressure Vessels in Spacecraft

| Daniel Arviv | Israel Aerospace Industries |
| Ilan Weissberg | Israel Aerospace Industries |

17:00-17:15	ThL2T6.5

DriveSat Student Project

| Nitzan Schwartz | Technion |
| Noa Offri | Elbit |

17:15-17:30	ThL2T6.6

Lunar Hoppers: Expanding Exploration Horizons on the Moon

| Yigal Harel | WeSpace Technologies |

ThL2T7   Hall G

Solid Mechanics

Chair:

16:00-16:15	ThL2T7.1

Enhancing Elastic Wave Attenuation in Single-Phase Phononic Crystals via the Coupling of Bragg and Local Resonance Mechanisms

| Ilaie Nadejde | Technion |
| Pavel Galich | Technion |

16:15-16:30	ThL2T7.2

Designing a Multistable Unit Cell Using Bistable Arches

| Ankush Yadav | Technion |
| Pavel Galich | Technion |

16:30-16:45	ThL2T7.3

Arc Discharge Heating for High-Enthalpy Wind Tunnel

| David Yanuka | Technion |

16:45-17:00	ThL2T7.4

Diodes and the Importance of Network Orientations in Diffusively-Coupled Networks

| Feng-Yu Yue | Technion |
| Daniel Zelazo | Technion |