

**49TH ISRAEL ANNUAL
CONFERENCE ON AEROSPACE SCIENCES**

PROGRAM

Dan Panorama Hotel, Tel Aviv 4 March, 2009
Technion, Haifa 5 March, 2009

Wednesday March 4, 2009
Dan Panorama, Tel Aviv

08:00-09:15 Registration

Hall A

09:20-09:30 Welcoming Address

O. Harari
Faculty of Aerospace Eng., Technion

09:30-10:20 **Keynote Lecture**

Chair: O. Harari, Technion

The Birth of the Israeli Aerospace Industry
M. Arens
Israeli Former Defense and Foreign
Minister

10:20-11:10 **Plenary Lecture - I**

Chair: I.J. Wygnanski, University of
Arizona

*History of the Development and Flight Test
of the Blended Wing Body (BWB X-48B)*
R.H. Liebeck
Boeing

Coffee Break 11:10-11:40

11:40-12:55 **Student Design
Competition**

Chair: S. Gali, Israel Ministry of Defense

Aerodynamic Design of a Wingsuit
Y. Segev, E. Yablochkin, Y. Green, L.
Mintz, O. Neeman, R. Levin, G. Iosilevskii,
Technion, Israel

*Mother Goose - an Unmanned Aerial
Reconnaissance and Observation System*
H. Caspi, Y. Baumgarten, D. Broitman, O.
Buch, Z. Hantsis, F. Ilie, E. Levi, I.
Malkine, I. Nachum, Technion, R. Zickel,
Zickel Eng., Israel

Bottlefly – AIAA DBF Contest
G. Beller, G. Marom, N. Ktalav, S.
Volniansky, Y. Guetta, N. Lahav, M. Yam,
Y. Rozeen, T. Moran, Technion, S. Tsach,
Israel Aerospace Industries

12:55-14:30 Buffet Lunch

14:30-15:45, Hall A

GNC – I

Chair: H. Weiss, RAFAEL

*Distributed Multi UAV Tracking of Ground
Targets in Urban Environments*
V. Shaferman and T. Shima, Technion,
Israel

*Navigation Aiding Using Image-Based
Relative Motion Measurements*
V. Indelman, P. Gurfil, E. Rivlin, Technion,
H. Rotstein, RAFAEL, Israel

*Info-Gap Approach to Spatial Search under
Severe Uncertainty*
I. Sisso, T. Shima, Y. Ben-Haim,
Technion, Israel

14:30-15:45 Hall B

Student Projects

Chair: S. Gali, Ministry of Defense

CANAAN – Medium Range Cruise Missile
O. Sivan, R. Eliav, O. Alish, N. Wexler, H.
Lerman, V. Krapp, M. Peres, N. Alperan,
Technion, M. Boazon, RAFAEL, Israel

*The Hamster Project: Heliosynchronous
Autonomous Microsatellite Terra-SAR
Escorting and Recording*
M. Eliyahu, R. Divekar, E. Vax, V.
Chereshchuk, O. Ohana, O. Shemesh, S.
Ifergan, F. Ortenberg, Technion, D.
Mishne, RAFAEL, Israel

14:30-15:45 Hall C

Heat Transfer and Fluid Mechanics

Chair: Y. Tambour, Technion

A Non-Polluting Solar Chemical Process for Production of Hydrogen and Carbon Black by Solar Thermal Methane Splitting

A. Kogan, Technion, M. Kogan, S. Barak, M. Epstein, A. Segal, R. Rubin, Y. Yehekel, D. Lieberman, Weizmann Institute, R. Arieli, Y. Hlopovitz, Technion, Israel

Rheological Properties of a Power-Law Suspension in the Near-Newtonian Region
V. Chernov, and B. Natan, Technion, Israel

Heat Transfer Using Impinging Jets Including Cross Flow Effects

Y. Levy, I. Gaissinski, V. Erenburg, V. Sherbaum, Technion, Israel

14:30-15:45 Hall D

Flow Control

Chair: I. Wygnanski, University of Arizona

Closed-Loop Active Flow Control Applied to a D-Shaped Cylinder for Wake Stabilization

O. Stalnov, I. Fono, A. Seifert, Tel Aviv University, Israel

On the Flow Effects of a Small Device

Z. Nadler, RAFAEL, E. Azar, Technion, T. Zarutzkaya, RAFAEL, R. Arieli, M. Talesnick, Technion, Israel

Plasma-Based Active Flow Control on Low Reynolds Number Airfoils

M. Bachmann, S. Vey, S. Uthes, O. Paschereit, TU Berlin, Germany, D. Greenblatt, Technion, Israel

14:30-15:45 Hall E

Flight Dynamics

Chair: M. Attar, Israel Aerospace Industries

Helicopter Rolling Takeoff Simulation
K. Enciu, IAF and A. Rosen, Technion, Israel

Autonomous Operation of Helicopters
S. Potyagaylo and O. Rand, Technion, Israel

14:30-15:45 Hall F

Smart Structures

Chair: G. Ghilai, Israel Aerospace Industries

On the Design and Analysis of a Piezomotor

S. Eliahou Niv and D. Oster, Israel Aerospace Industries

Design, Analysis and Testing of a Smart Fin

A. Nir and H. Abramovich, Technion, Israel

A Perspective of Power Unit with Fuel Cells for Airplanes Civil Aviation

S. Martynenko, L.S. Yanovskiy, A.V. Baykov, Central Institute of Aviation Motors, Russia

15:45-16:05 Coffee Break

16:05-17:20 Hall A

GNC II

Chair: T. Shima, Technion

Robust Linfinity Induced Optimal Filtering of Systems with State Multiplicative Noise

I. Yaesh, Israel Military Industries, U. Shaked, Tel-Aviv University, Israel

Novel Quaternion Stochastic Modeling and Filtering

D. Choukroun, Ben Gurion University, Israel

Obstacle Avoidance Using Optical Flow Balancing and Looming

P.J. Shelnutt, M. Pachter, P. Chandler, Air Force Inst. of Technology, WP AFB, USA

16:05-17:20 Hall B

Astrodynamics

Chair: P. Gurfil, Technion

Natural Sun Simulator for Space Systems Testing

F. Ortenberg and M. Guelman, Technion, Israel

Design of Out-of-Ecliptic Orbits for Space-Borne Telescopes

G. Nir and P. Gurfil, Technion, Israel

Numerical Methods to Design Low-Energy, Low-Thrust Sun-Perturbed Transfers to the Moon

G. Mingotti, F. Topputo, F. Bernelli-Zazzera, Politecnico di Milano, Italy

16:05-17:20, Hall C

Spray Flames

Chair: E. Sher, Ben-Gurion University

A Numerical Study of the Stability of Premixed Spray Flames

J.B. Greenberg, Technion, L. Kagan, G. Sivashinsky, Tel Aviv University, Israel

General Asymptotic Formulation for Spray Diffusion Flames Including Interphase Momentum and Heat Transfer

S. Lerman, A. Dvorjetski, Israel Air Force, J.B. Greenberg, Technion, Israel

Influence of Inlet Asymmetries on the Characteristics of Multiple Spray Flames

L. Hamelnick and J.B. Greenberg, Technion, Israel

16:05-17:20 Hall D

Fluid Dynamics

Chair: G. Iosilevskii, Technion

On the Relevance of Nonlinear Interactions to Sound Radiation from Subsonic Jets

V. Saponitsky and N. Sandham, University of Southampton, UK

Numerical and Theoretical Study of a Buoyant Localized Disturbance in Irrotational Shear Flows

G. Alon, J. Philip, J. Cohen, Technion, Israel

Lagrangian Measurements Using Three Dimensional Particle Tracking Velocimetry in Lid-Driven Cavity Flows

R. Elfassi and A. Liberzon, Tel Aviv University, Israel

16:05-17:20 Hall E

ADMM – I

Chair: D. Artzi, Urban Aeronautics

Thermal and Mechanical Optimisation of the First Israeli Nano-Satellite

D. Rockberger, O. Eldad, D. Portnoy, Z. Sherman, R. Tamir, Israel Aerospace Industries

Using Simulation for the G250 Assembly Line Design

A. Minkov, P. Belenitsky, K. Rozowsky, Israel Aerospace Industries

Spacecraft Solar Array Structure Design

I. Weissberg, T. Gati, M. Halfon, Israel Aerospace Industries

16:05-17:20 Hall F

Propellants and Combustion I

Chair: B. Natan, Technion

Advanced Green/Clean or Alternate Rocket Propellants

H. Singh, University of Pune, India

Fundamental Diffusion Flame Calculations Based on Detailed Kinetics for an AP Composite Propellant

M.L. Gross and M.W. Beckstead, Brigham Young University, USA

Air Launch of Microsatellites from a Combat Aircraft Using a Three-Body-Solid Rocket Motors Configuration

A. Socher and A. Gany, Technion, Israel

17:30-18:30 Hall D General Meeting – ISAA

Thursday, March 5, 2009
Technion, Haifa
Churchill Auditorium

09:20-09:30 Welcoming Address

Chair: O. Rand, Technion

O. Shmueli
Vice President for Research
Technion

09:30-10:20

Plenary Lecture - II

Chair: D. Weihs, Technion

Flight: Fast and High; Low and Slow
B. Tryggvason
University of Western Ontario, Canada

10:20-10:50 Coffee Break

10:50-11:40

Plenary Lecture - III

Chair: S. Tsach, Israel Aerospace Industries

Unmanned Aerial Systems – Trends and Challenges
D. Ben-David
Matrix Defense Co., Israel

11:40-12:30

Plenary Lecture - IV

Chair: H. Rotstein, RAFAEL

Cyber-Aerospace Systems: The Challenges Ahead
G. Balas
University of Minnesota, USA

12:30-13:50 Buffet Lunch

Afternoon Sessions
Faculty of Aerospace Engineering (AE)

13:50-15:30 Room 149, AE

ADMM II

Chair: E. Kroll, Technion

B737-400 Passenger Conversion to Special Freighter

I. Berlowitz and L. Khalifa, Israel
Aerospace Industries

The Development of "HERON TP" Medium Altitude Long Endurance UAV

A. Kosharek, Israel Aerospace Industries

New Approach Toward Realizing Field Emission Cathode for Hall Thrusters

I. Kronhaus, A. Kapulkin, M. Guelman,
Technion, Israel

13:50-15:30 Room 150, AE

Structures

Chair: H. Abramovich, Technion

FE Model in Assistance of a Swashplate Failure Investigation

I. Shiroky, A. Palitsky, I. Strauss, E.
Rabinovitch, Israel Air Force

Instability and Collapse of Sandwich Shells Representing A/C Wing Skins

V. Weissberg, T. Genosar, G. Ghilai, Israel
Aerospace Industries

IAF Feasibility Study of MWM Embedded Sensors for Detection and Tracing of Cracks Propagation

N. Goldfine, JENTEK Sensors Inc., USA,
D. Gruszkeiwicz, D. Neuman, K. Levi,
Israel Air Force, D. Grundy, JENTEK
Sensors Inc.

13:50-15:30 Room 235, AE

GNC III

Chair: D. Choukroun, Ben-Gurion University

Model Matched Stochastic Guidance Law for a Bounded Acceleration Missile

A. Ronen, G. Hexner, H. Weiss, RAFAEL, T. Shima, Technion, Israel

Information Sharing Tracking Filters for a Two-on-One Missile Engagement

V. Shaferman and Y. Oshman, Technion, Israel

Bounds on the RMS Miss of Radar Guided Missiles against Sinusoidal Target Maneuvers

I. Rusnak, RAFAEL, Israel

Estimation Aspects in the Interception of Randomly Maneuvering Targets

V. Turetsky and J. Shinar, Technion, Israel

13:50-15:30 Room 240, AE

Flow Control and CFD

Chair: A. Liberzon, Tel Aviv University

Roll Control via Active Flow Control: From Concept Development to Flight

A. Seifert, I. Fono, O. Stalnov, S. David, I. Dayan, Tel Aviv University, S. Bauminger, R. Guedj, S. Chester, A. Abershitz, Israel Aerospace Industries

A Computational Analysis of Missiles Nose Ejection during Flight

Y. Dagan and E. Arad, RAFAEL, Israel

PSE Formulation in Non-Orthogonal Curvilinear Coordinate System and Code Development for Stability and Transition Analysis for 3-D Compressible Boundary Layers

L. Kosarev, S. Seror, Israel Aerospace Industries, Y. Lifshitz, Technion, Israel

15:30-15:50 Coffee Break

15:50-17:30 Room 149, AE

ADMM III

Chair: I. Kressel, Israel Aerospace Industries

The Use of Parameter Analysis for Innovative Conceptual Design

E. Kroll, Technion, Israel

Development of an Engineering Tool for Evaluation of Structural Durability of Corroded Landing Gear Supporting Truss in "FOUGA CM 170 R"

I. Jacobovitz, I. Dukhovny, Y. Golan, E. Rabinovitch, Israel Air Force

Risk-Analysis -- a Supplement to Damage-Tolerance Analysis

A. Brot, Israel Aerospace Industries

15:50-17:30 Room 150, AE

Propellants and Combustion II

Chair: A. Gany, Technion

The Effect of the Particle Motion on Aluminum Agglomeration in Solid Propellants

V. Marvin and B. Natan, Technion, Israel

Studies on Titanium Powder Based Fuel Rich Propellants for IRR/Scramjet Applications

H. Singh, University of Pune, India

Concept and Analysis of Impulse Augmentation Using a Combustion Chamber Discharging a Concentrated Mass

D. Michaels and A. Gany, Technion, Israel

Experimental Investigation and Modeling of Metal Hydride Decomposition and Oxidation

G. Stepura, V. Rosenband, A. Gany, Technion, Israel

15:50-17:30, Room 235, AE

GNC IV

Chair: S. Boyarski, Israel Military Industries

Closed-Loop Fin Allocation in Missiles
O.Yekutieli, RAFAEL, Israel

Reducing Miss Distance by Using Twisting Wing Control
O. Birarov, Y. Ben-Asher, Technion, G. Hexner, RAFAEL, Israel

Direct Adaptive Guidance - a Neural Network Based Implementation
I. Yaesh and M. Wetzler, Israeli Military Industries

In Flight Estimation of Elastic Frequencies of Missiles Using Extended Kalman Filter
D. Lifshitz and A. Kahane, Israel Aerospace Industries

15:50-17:30, Room 240, AE

Aerodynamics

Chair: I. Frankel, Technion

Lateral Momentum Augmentation on a Spinning Cone in Supersonic Flow
I. Detinis and D. Weihs, Technion, Israel

Aerodynamic Design of Wing-Body-Junction Driven by Accurate Navier-Stokes Computations
S. Peigin, Israel Aerospace Industries and B. Epstein, Academic College of Tel Aviv Yaffo, Israel

Aerodynamics in Rarefied Gas Environment Using DSMC Simulation
Y. Segev and J. Brandeis, RAFAEL, Israel

An Aerodynamic Approach for the Mapping of FOD Risk during an Air Refueling Mission upon Tanker
M. Weidenfeld and M. Iovnovich, Israel Air Force

15:50-17:30 Room 241, AE

CFD

Chair: S. Seror, Israel Aerospace Industries

Heat Transfer Characteristics of a Multiple Jet Impingement System
G. Arvind Rao, Technical University of Delft, The Netherlands, M. Kitron-Belinkov, Kinneret College on the Sea of Galilee, Y. Levy, Technion, Israel

CFD Code for Reactive Real Gas Using a New Numerical Chemical Solver
O. Peles, S. Yaniv, J. Sivan, Israel Military Industries

Development of Numerical Methods for Solving Navier-Stokes Equations in Primitive Variables Formulation
S. Martynenko and L.S. Yanovskiy, Central Institute of Aviation Motors, Russia
