

# ECOS 2006

## Program

19th International Conference  
on Efficiency, Cost, Optimization, Simulation  
and Environmental Impact of Energy Systems

Aghia Pelagia, Crete, Greece  
12-14 July 2006

# ECOS 2006

## General Information

### Contact

Christos A. Frangopoulos  
National Technical University of Athens  
School of Naval Architecture and Marine Engineering  
Heron Polytechniou 9  
157 80 Zografou  
Greece

Tel.: +30-210-772 1108  
Fax: +30-210-772 1117  
E-Mail: [ecos2006@central.ntua.gr](mailto:ecos2006@central.ntua.gr)  
Website: [www.ecos2006.ntua.gr](http://www.ecos2006.ntua.gr)

### Conference Location

Capsis Beach Hotel & Sofitel Capsis Palace Hotel & Convention Centre  
Aghia Pelagia  
715 00 Heraklion, Crete  
Greece

Tel.: +30-2810-811112, 811212      Fax: +30-2810-811076, 811314  
E-mail: [capsis-crete@capsis.gr](mailto:capsis-crete@capsis.gr)      Web site: [www.capsis.gr](http://www.capsis.gr)

### Transportation

The closest airport and seaport is at Heraklion. There are several flights a day from Athens to Heraklion. During the summer period there are also direct flights from other European cities to Heraklion. Usually two ferryboats leave the port of Piraeus every evening and reach Heraklion early next morning.

### Taxi

Cost of one-way between Heraklion and Aghia Pelagia: about 35 Euros.  
Tel.: 2810-210102 (Heraklion).  
Cell phone: 6937-333719 (Aghia Pelagia).

### Bus

The bus station at Heraklion is next to the seaport. There is a bus stop at Aghia Pelagia next to the Capsis Hotel. Cost of one-way ticket: about 3 Euros. Bus schedule:

Departure from	Monday to Saturday	Sunday
Heraklion	8:15, 9:00, 9:45, 14:30, 17:30	9:00, 14:30
Aghia Pelagia (time approximate)	9:00, 9:45, 10:30, 15:45, 18:15	9:45, 15:15

### Registration Desk

It is located in the Lobby Area of the SOFITEL CAPSIS PALACE.

### Technical Sessions

Oral presentations are given in rooms MINOS, ARIADNE A', ARIADNE C' and APOLLO A'. Each room is equipped with a digital projector connected to a PC, and an overhead projector.

Poster presentations are given in VERANDA THALASSA. A board with dimensions of 1.2 m by 1.2 m is available for each poster presentation.

### PC's

PC's are installed at the Business Center located at the Lobby Area. They are operated by means of a time card, which can be purchased from the Reception of the hotel.

For persons bringing their own laptops, the hotel provides a wireless wi-fi connection in all its public areas. Pass-cards are needed, which can be purchased from the Reception of the hotel.

### Lunch

It is served at the Restaurant ZEUS.

### Coffee breaks

Coffee is served at ADONIS TERRACE.

# ECOS 2006 Program

## Tuesday, 11 July

- 17:00 - 20:00 **Registration desk open**  
18:00 - 20:00 **Scientific Committee Meeting** (Room: *ARIADNE B*)

## Wednesday, 12 July

- 08:00 - 16:00 **Registration desk open**  
09:00 - 09:15 **Opening speeches**  
09:15 - 10:00 **Plenary Session I: Keynote address**  
George Hatsopoulos, MIT, USA  
*From Entropy to Enterprise - Using Thermodynamics to build a Fortune 500 Company*  
10:00 - 10:30 **Coffee**  
10:30 - 12:30 **Technical Sessions**  
Four in parallel  
12:30 - 14:00 **Lunch**  
**Poster presentations**  
14:00 - 16:00 **Technical Sessions**  
Four in parallel  
17:00 - 20:00 **Visit at Knossos Palace and Archeological Museum of Heraklion**  
(Reservation required. See: "Sightseeing Tours")  
20:00 **Welcome Reception**  
*Area of DAEDALOS pool, Capsis Hotel*

## Thursday, 13 July

- 08:00 - 18:00 **Registration desk open**  
08:45 - 09:30 **Plenary Session II: Keynote address**  
Elias P. Gyftopoulos, MIT, USA  
*Thermodynamic and Quantum Thermodynamic Answers to Einstein's Concerns about Brownian Movement*  
09:30 - 10:00 **Coffee**  
10:00 - 12:00 **Technical Sessions**  
Four in parallel

- 12:00 - 13:30 **Lunch**  
**Poster presentations**  
13:30 - 15:30 **Technical Sessions**  
Four in parallel  
15:30 - 16:00 **Coffee**  
16:00 - 17:00 **Technical Sessions**  
Four in parallel  
17:00 - 18:15 **Panel Discussion: Exergy, Ecology and Economy**  
20:30 **Conference Dinner**  
*Taverna, Capsis Hotel*

## Friday, 14 July

- 08:00 - 16:00 **Registration desk open**  
08:30 - 10:00 **Plenary Session III: Keynote addresses 3, 4**  
Carl-Jochen Winter, International Hydrogen Association  
*Energy Policy is Technology Politics – The Hydrogen Energy Case*  
Alex C. Alkidas, Oakland University, USA  
*Combustion Advancements in Gasoline Engines*  
10:00 - 10:30 **Coffee**  
10:30 - 12:30 **Technical Sessions**  
Four in parallel  
12:30 - 13:45 **Lunch**  
13:45 - 15:45 **Technical Sessions**  
Four in parallel  
15:45 - 16:15 **Coffee**  
16:15 - 17:30 **Panel Discussion: Optimization of the Structure of Energy Systems**  
17:30 - 18:00 **Closing of the Conference**  
Professor Alberto Mirandola: ECOS 2007

## Saturday, 15 July

- 08:00 - 20:00 **Post-conference tour** (reservation required)  
Fodele, Rethymno, Chania, Samaria Gorge Panoramic

## Accompanying Persons Program

Reservation is required for all the activities.  
See: "Registration" and "Sightseeing Tours".

### Wednesday, 12 July

Morning Suggestion: enjoy the sea!  
17:00 – 20:00 Visit at **Knossos Palace and Archeological Museum of Heraklion**  
20:00 **Welcome Reception**  
*Area of DAEDALOS pool, Capsis Hotel*

### Thursday, 13 July

08:00 - 18:30 Excursion to Ag. Nikolaos, Elounda, Spinaloga

### Friday, 14 July

08:00 - 16:00 Excursion to Lassithi Plateau

### Saturday, 15 July

08:00 - 20:00 **Post-conference tour**  
Fodele, Rethymno, Chania, Samaria Gorge Panoramic

# ECOS 2006

## Technical Program

## ECOS 2006 Technical Program Overview

Room:	MINOS	ARIADNE A'		ARIADNE C'	APOLLO A'
Wednesday	09:00 - 09:15	<b>Opening speeches</b>			
	09:15 - 10:00	<b>Plenary Session</b> Keynote address 1			
	10:00 - 10:30	<i>Coffee</i>			
	10:30 - 12:30	Heat and Mass Transfer I	Modeling and Simulation	Life Cycle Assessment and Sustainability	Fuel Cells and Integrated Systems I
	12:30 - 14:00	<i>Lunch and Poster presentations</i>			
	14:00 - 15:00	Heat and Mass Transfer II	Thermoeconomic Analysis	Refrigeration and Air Conditioning	Fuel Cells and Integrated Systems II
	15:00 - 16:00	Combustion		Heat Pumps	Hydrogen Technology
Thursday	08:45 - 09:30	<b>Plenary Session</b> Keynote address 2			
	09:30 - 10:00	<i>Coffee</i>			
	10:00 - 12:00	Unified Quantum Theory of Mechanics and Thermodynamics	Optimization I	Internal Combustion Engines I	Pollution Abatement, CO <sub>2</sub> Emissions, Capture and Sequestration I
	12:00 - 13:30	<i>Lunch and Poster presentations</i>			
	13:30 - 15:30	Thermodynamics, Exergy and Second-Law Analysis I	Optimization II	Conventional and Advanced Power Plants I	Pollution Abatement, CO <sub>2</sub> Emissions, Capture and Sequestration II
	15:30 - 16:00	<i>Coffee</i>			
	16:00 - 17:00	Thermodynamics, Exergy and Second-Law Analysis II	Diagnostics and Maintenance of Energy Systems	Energy Use in Buildings	
17:00 - 18:15	<b>Panel Discussion</b> Exergy, Ecology and Economy				
Friday	08:30 - 10:00	<b>Plenary Session</b> Keynote addresses 3, 4			
	10:00 - 10:30	<i>Coffee</i>			
	10:30 - 12:30	Renewable Energy Processes and Systems I	Process Analysis, Design and Synthesis	Internal Combustion Engines II	Cogeneration and District Heating & Cooling I
	12:30 - 13:45	<i>Lunch</i>			
	13:45 - 15:45	Renewable Energy Processes and Systems II	Process Integration in Thermal and Chemical Systems	Conventional and Advanced Power Plants II	Cogeneration and District Heating & Cooling II
	15:45 - 16:15	<i>Coffee</i>			
	16:15 - 17:30	<b>Panel Discussion</b> Optimization of the Structure of Energy Systems			
17:30 - 18:00	<b>Closing of the Conference</b>				

Room:	MINOS	ARIADNE A´	ARIADNE C´	APOLLO A´
09:00	<b>Opening Speeches</b>			
09:15	<b>Plenary Session – Keynote Address 1:</b> <b>From Entropy to Enterprise - Using Thermodynamics to Build a Fortune 500 Company</b> Hatsopoulos G.N. Volume 1, Page 3			
10:00	<i>Coffee</i>			
10:30	<b>Heat and Mass Transfer I</b> Chair: N. Vlachos Co-chair: A. Hernandez	<b>Modeling and Simulation</b> Chair: E. Sciubba Co-chair: D. Bedeaux	<b>Life Cycle Assessment and Sustainability</b> Chair: G. Hirs Co-chair: E. Carnevale	<b>Fuel Cells and Integrated Systems I</b> Chair: E. Kakaras Co-chair: L. Magistri
10:30	<b>Direct Numerical Simulation of an Efficient Configuration for Fusion Heat Removal Blankets</b> Kakarantzas S.C., Grecos A.P., Vlachos N.S., Sarris I.E., Kneapen B., Carati D. Volume 1, Page 273	<b>Transfer Coefficients for Liquid-Vapor Transitions Derived for N-Octane</b> Simon J.M., Bedeaux D., Kjølstrup S., Johannessen E. Volume 1, Page 347	<b>Life Cycle Assessment of Different Hypotheses of Hydrogen Production for Vehicle Fuel Cells Fuelling</b> Lombardi L., Carnevale E., Giubblini F., Scalas E., Corti A. Volume 2, Page 785	<b>Implementation Potential of Fuel Cell Systems for CHP: Threat and Opportunity Analysis</b> Zabalza I., Aranda A., Valero Al. Volume 3, Page 1377
10:50	<b>Solar Calcinator – a CFD Parametric Study</b> Fidasos D.K., Baxevanou C.A., Vlachos N.S. Volume 1, Page 281	<b>Application of the CAMEL® Process Simulator to the Dynamic Simulation of Gas Turbines</b> Cennerillip S., Fiorini P., Sciubba E. Volume 1, Page 355	<b>LCA Analysis of Photovoltaic Electric Production</b> Stoppato A. Volume 2, Page 793	<b>High Temperature Fuel Cells with Integrated Biomass Gasification and CO<sub>2</sub>-Separation</b> Schlitzberger C., Leithner R. Volume 3, Page 1385
11:10	<b>Enhanced Heat Transfer in Concentric Pipes subject to Reciprocating Flow</b> Ramirez-Vazquez J.A., Hernandez-Guerrero A., Ramos E., Miranda-Razo V.H. Volume 1, Page 289	<b>Dimensional Modeling of Biomass Pyrolysis Based on a Nodal Approach</b> Vijeu R., Gerun L., Bellettre J., Tazerout M., Castelain C. Volume 1, Page 365	<b>Application of Exergy Analysis and Life Cycle Assessment to the Oil Industry</b> Portha J.-F., Archane A., Pons M.-N., Jaubert J.-N., Burkhardt T., Hoffmann F. Volume 2, Page 801	<b>An Innovative Biomass Gasification Process and its Coupling with Microturbine and Fuel Cell Systems</b> Karellas S., Karl J., Kakaras E. Volume 3, Page 1393
11:30	<b>Microchannel Heat Sinks as the Solution for Extremely High Fluxes Dissipation</b> García-González J., Hernández-Guerrero A., Rubio-Arana C. León-Conejo J.C. Volume 1, Page 307	<b>Comparison Analysis of Boiler Ash Deposit and Pore Structure Simulated by the Ballistic Model</b> Mendes L.J.N., Forgerini F.L., Figueiredo W., Bazzo E., Azevedo J.L.T. Volume 1, Page 373	<b>Exergy and Life Cycle Assessment of Polygeneration System</b> Wang L., Ni W., Li Z. Volume 2, Page 807	<b>Exergetic Analysis of SOFC and Biomass Gasification Integration</b> Panopoulos K.D., Fryda L., Karl J., Poulou S., Kakaras E. Volume 3, Page 1401
11:50	<b>Numerical Analysis of Elevated Jet in Crossflow</b> Bayraktar S., Yilmaz T. Volume 1, Page 329	<b>Modelling and Stability of a Single-Shaft Combined Cycle Power Plant</b> Mantzaris J., Vournas C. Volume 1, Page 381	<b>Sustainable Energy Management in a Production Plant: A Systems Approach</b> Kouloura T.C., Panagiotakopoulos P.D. Volume 2, Page 815	<b>Modeling and Dynamics of an Autothermal JP5 Reformer for Marine Fuel Cell Applications</b> Tsourapas V., Sun J., Nickens A. Volume 3, Page 1419
12:10		<b>Thermodynamic Modeling and Second Law Analysis for an Ammonia-Water Absorption System Associated to a Microturbine</b> Rossa J.A., Bazzo E. Volume 2, Page 651	<b>Advanced Decentralized Energy Generation a Step towards Sustainable Development of Croatian Islands</b> Krajačić G., Duić N., Carvalho M.G. Volume 3, Page 1275	
12:30	<i>Lunch and Poster Presentations (12:30 – 14:00)</i>			

Room:	MINOS	ARIADNE A'	ARIADNE C'	APOLLO A'
14:00	<b>Heat and Mass Transfer II</b> Chair: A. Sagia Co-chair: N. Duic	<b>Thermoeconomic Analysis</b> Chair: S. Nebra Co-chair: S. de Oliveira Jr.	<b>Refrigeration and Air Conditioning</b> Chair: P. Raskovic Co-chair: M. Venegas	<b>Fuel Cells and Integrated Systems II</b> Chair: S. Kjelstrup Co-chair: L. Vanoli
14:00	<b>A Parametric Study of Flow and Heat Transfer in a Thermosyphon Loop at specified Wall Temperatures</b> Başaran T., Küçüka S. Volume 1, Page 323	<b>Influence of the Pro-Ecological Tax on the Market Price of Fuels and Electricity</b> Szargut J., Stanek W. Volume 1, Page 407	<b>Experimental Characterization of a Single Stage LiBr-H<sub>2</sub>O Absorption Test Rig</b> Gutiérrez G., Venegas M., Aumente P.R., Millán M.I., Neumann A.L. Volume 3, Page 1311	<b>A Finite-Volume Axial-Symmetric Model of a Tubular Solid Oxide Fuel Cell</b> Calise F., D'Accadia M.D., Palombo A., Vanoli L. Volume 3, Page 1409
14:20	<b>The Impact of Glazing on Energy Consumption and Comfort</b> Stegou-Sagia A., Antonopoulos K., Angelopoulou C., Kotsiovelos G. Volume 2, Page 825	<b>On the Cost Formation Process of the Residues</b> Torres C., Valero A. Volume 1, Page 415	<b>A Rich Solution Spray as a Refining Method in a Small Power, Single Effect, Solar Assisted Absorption Machine with the Pair NH<sub>3</sub>/ H<sub>2</sub>O: Experimental Results</b> Mendes L.F., Collares-Pereira M., Ziegler F. Volume 3, Page 1317	<b>Super-Capacitors Fuel-Cell Hybrid Electric Vehicle Optimization and Control Strategy Development</b> Paladini V., Donato T., de Risi A., Laforgia D. Volume 3, Page 1427
14:40		<b>Exergy Based Method for Analyzing the Composition of the Electricity Cost Generated in Gas-Fired Combined Cycle Plants</b> Borelli S.J.S., de Oliveira Jr. S. Volume 1, Page 425		<b>Thermoeconomic Analysis of Pressurized Hybrid SOFC Systems with CO<sub>2</sub> Separation</b> Franzoni A., Magistri L., Traverso A., Massardo A.F. Volume 3, Page 1437
15:00	<b>Combustion</b> Chair: A. de Risi Co-chair: S. Merola	<b>Thermoeconomic Analysis</b> <i>(Continued)</i>	<b>Heat Pumps</b> Chair: R. Yokoyama Co-chair: T. Morosuk	<b>Hydrogen Technology</b> Chair: D. Brüggemann Co-chair: K. Ptasinski
15:00	<b>Synopsis of Experimentally Determined Effects of Electrostatic Charge on Gasoline Sprays</b> Anderson E.K., Kyritsis D.C., Carlucci A.P., De Risi A. Volume 1, Page 225	<b>Thermoeconomic Assessment for Management Decision: Three Brazilian Industrial Cases</b> Lora E.E.S., Santos J.J.C.S., Venturini O.J., do Nascimento M.A.R., Zampieri M., Arrieta F.R.P., Teixeira F. Volume 1, Page 433	<b>Performance Analysis of a CO<sub>2</sub> Heat Pump Water Heating System by Numerical Simulation with a Simplified Model</b> Yokoyama R., Okagaki S., Ito K., Takemura K. Volume 3, Page 1353	<b>Exergoeconomic Estimates for a Novel Process with Integrated CO<sub>2</sub> Capture for the Production of Hydrogen and Electric Power</b> Tsatsaronis G., Kapanke K., Marigorta A.M.B. Volume 3, Page 1581
15:20	<b>A Combined Experimental/Computational Investigation of Stratified Combustion in Methane-Air Mixtures</b> Kang T., Kyritsis D.C. Volume 1, Page 233	<b>On the Thermoeconomic Modeling for Cost Allocation in a Dual-Purpose Power and Desalination Plant</b> Santos J.J.C.S., do Nascimento M.A.R., Lora E.E.S. Volume 1, Page 441	<b>Parametric Analysis of a Standing Column Well Using a Simplified One-Dimensional Model</b> Abu-Nada E., Al-Sarkhi A.S., Akash B., Nijmeh S. Volume 3, Page 1361	<b>Exergy Analysis of Hydrogen Production Methods from Biomass</b> Ptasinski K.J., Prins M.J., van der Heijden S.P. Volume 3, Page 1601
15:40	<b>Entropy Generation Rates in Swirling Diffusion Flames</b> Stanciu D., Marinescu M. Volume 1, Page 239		<b>Case Studies of Vertical Ground Source Heat Pumps in Belgian Hospitals</b> Desmedt J., Hoes H. Volume 3, Page 1367	

Room:	MINOS	ARIADNE A'	ARIADNE C'	APOLLO A'
08:45	<b>Plenary Session – Keynote Address 2</b> <b>Thermodynamic and Quantum Thermodynamic Answers to Einstein's Concerns about Brownian Movement</b> Gyftopoulos E.P. Volume 1, Page 11			
09:30	<i>Coffee</i>			
10:00	<b>Unified Quantum Theory of Mechanics and Thermodynamics</b> Chair: M. von Spakovsky Co-chair: G. Beretta	<b>Optimization I</b> Chair: K. Lucas Co-chair: K. Ito	<b>Internal Combustion Engines I</b> Chair: D. Hountalas Co-chair: V. Giakoumis	<b>Pollution Abatement, CO<sub>2</sub> Emissions, Capture and Sequestration I</b> Chair: P. Mathieu Co-chair: Na Zhang
10:00	<b>Entropy: an Inherent, Nonstatistical Property of Any System in Any State</b> Gyftopoulos E.P. Volume 1, Page 49	<b>Multicriterial Optimisation of Communal Energy Supply Concepts</b> Bouvy C., Lucas K. Volume 2, Page 543	<b>Cylinder Wall Insulation Effects on the First- and Second-Law Balances of a Turbocharged Diesel Engine Operating under Transient Load Conditions</b> Giakoumis E.G. Volume 2, Page 1035	<b>The IPCC Special Report on Carbon Dioxide Capture and Storage</b> Mathieu P. Volume 3, Page 1611
10:20	<b>From Watt's Steam Engine to the Unified Quantum Theory of Mechanics and Thermodynamics</b> Hatsopoulos G.N. Volume 1, Page 61	<b>Thermoeconomic Optimization of the Integration of Electrolysis in a Wood to Methane Process</b> Gassner M., Maréchal F. Volume 2, Page 553	<b>Diesel Engine Development in View of Reduced Emission Standards</b> Knecht W. Volume 2, Page 1053	<b>Configuration Analysis of Oxy-Fuel Cycles with Natural Gas Reforming and CO<sub>2</sub> Capture</b> Zhang N., Lior N. Volume 3, Page 1619
10:40	<b>Steepest-Entropy-Ascent Irreversible Relaxation towards Thermodynamic Equilibrium: the Dynamical Ansatz completes the Gyftopoulos-Hatsopoulos Unified Theory with a General Quantal Law of Causal Evolution</b> Beretta G.P. Volume 1, Page 71	<b>Sensitivity Analysis in Structural Optimization of Energy Supply Systems for a Hospital</b> Yoshida S., Ito K., Yokoyama R. Volume 2, Page 561	<b>Zero-Dimensional Rohr Simulation for DI Diesel Engines – A Generic Approach</b> Chmela F.G., Pirker G.H., Wimmer A. Volume 2, Page 1061	<b>Future CO<sub>2</sub> Removal From Pulp Mills – Process Integration Consequences</b> Hektor E., Berntsson T. Volume 3, Page 1629
11:00	<b>Experimental Validation of the Unified Theory</b> Çubukçu E. Volume 1, Page 85	<b>Optimization of Thermal Energy Consumption in Sugar Cane Factories</b> Ensinas A.V., Nebra S.A., Lozano M.A., Serra L. Volume 2, Page 569	<b>Effect of EGR Temperature for Various EGR Rates on Heavy Duty DI Diesel Engine Performance and Emissions</b> Hountalas D.T., Mavropoulos G.C., Binder K.B. Volume 2, Page 1071	<b>System Study of CO<sub>2</sub> Capture in Production of Bio-based Motor Fuels</b> Lindfeldt E.G., Westermark M.O. Volume 3, Page 1637
11:20	<b>Teaching Thermodynamics as a Science that applies to Any System (Large or Small) in Any State (Stable or Not Stable Equilibrium)</b> von Spakovsky M.R., Metghalchi H. Volume 1, Page 93	<b>Methodology for the Thermoeconomic and Design Optimization of a Heat Recovery Steam Generator</b> Durán D., Rovira A., Valdés M. Volume 2, Page 577	<b>Theoretical Study of the Effects of Pilot Fuel Quantity and its Injection Timing on the Performance and Emissions of a Dual Fuel Diesel Engine</b> Papagiannakis R.G., Hountalas D.T., Rakopoulos C.D. Volume 2, Page 1081	<b>Second Law Comparisons of Oxy-Fuel Combustion and Post Combustion Carbon Dioxide Separation</b> Simpson A.P., Simon A.J. Volume 3, Page 1649
11:40	<b>Teaching the Quantal Exposition of the Unified Quantum Theory of Mechanics and Thermodynamics</b> von Spakovsky M.R. Volume 1, Page 103		<b>Theoretical Study of DI Diesel Engine Performance and Pollutant Emissions Using Comparable Air-Side and Fuel-Side Oxygen Addition</b> Zannis T.C., Pariotis E.G., Hountalas D.T., Rakopoulos D.C., Leventis Y.A. Volume 2, Page 1093	<i>Announcement:</i> <b>European Technology Platform for Zero Emissions Fossil Fuels Power Plants</b> An. Valero Not in the proceedings
12:00	<i>Lunch and Poster Presentations (12:00 – 13:30)</i>			



Room:	MINOS	ARIADNE A'	ARIADNE C'	APOLLO A'
13:30	<b>Thermodynamics, Exergy and Second-Law Analysis I</b> Chair: Ö. Arnas Co-chair: A. Dobrovicescu	<b>Optimization II</b> Chair: D. Favrat Co-chair: F. Marechal	<b>Conventional and Advanced Power Plants I</b> Chair: A. Gomez Co-chair: E. Silva Lora	<b>Pollution Abatement, CO<sub>2</sub> Emissions, Capture and Sequestration II</b> Chair: M. Feidt Co-chair: T. Berntsson
13:30	<b>A New Interpretation of Thermodynamics</b> Ishida M., Ohba T.  Volume 1, Page 119	<b>On the Synthesis of Thermal Systems: a Method to Determine Optimal Heat Transfer Interactions</b> Lazzaretto A., Toffolo A. Volume 2, Page 493	<b>Evaluation of Some Thermal Power Cycles for Use in Space</b> Tarlecki J., Lior N., Zhang N. Volume 2, Page 879	<b>Heat Optimisation of a Staged Gas-Solid Mineral Carbonation Process for Long-Term CO<sub>2</sub> Storage</b> Zevenhoven R., Teir S., Eloneva S. Volume 3, Page 1661
13:50	<b>Exergy Determination of 70 Minerals Relevant to a Life Cycle Approach based on Recent Thermodynamic Data</b> De Meester B., Dewulf J., Van Langenhove H., Janssens A. Volume 1, Page 129	<b>Entropy Production Minimization confirm Two Well Established Process Technologies</b> Kjelstrup S., Johannessen E., Røsjorde A. Volume 2, Page 503	<b>From Jet Fuel to Electric Power Using Combustion at Small Scale and a Free Piston Stirling Engine</b> Gomez A., Berry J., Roychoudhury S., Huth J. Volume 2, Page 889	<b>Proposal of a Pollutants-Confining Reactor System and its Exergy Analysis</b> Ohba T. Volume 3, Page 1671
14:10	<b>Evolution of the Decrease in Mineral Exergy throughout the 20th Century. 1) The Case of Copper in the US</b> Valero Al., Valero An., Arauzo I. Volume 1, Page 135	<b>Automatic Synthesis of Mathematical Models using Graph Theory for Optimization of Thermal Energy Systems</b> Grekas D.N., Frangopoulos C.A. Volume 2, Page 513	<b>Innovative Applications of Organic Rankine Cycle</b> Schuster A., Karellas S., Karl J. Volume 2, Page 897	<b>Effect of Pressure and Alkalinity on the Reactivity of Ca(OH)<sub>2</sub> -Fly Ash Sorbents Used for SO<sub>2</sub> Removal</b> Karatepe N., Özyuğuran A., Ersoy-Meriçboyu A. Volume 3, Page 1679
14:30	<b>Exergy Analysis of Hypersonic Propulsion Systems: Performance Comparison of Two Different Configurations at Cruise Conditions</b> Amati V., Bruno C., Sciubba E., Simone D. Volume 1, Page 145	<b>Optimization of Energy Systems Based on Evolutionary and Social Metaphors</b> Dimopoulos G.G., Frangopoulos C.A. Volume 2, Page 523	<b>Simulation of a Greenfield Oxyfuel Lignite-fired Power Plant</b> Kakaras K., Koumanakos A., Doukelis A., Giannakopoulos D., Vorrias I. Volume 2, Page 905	<b>Capture of CO<sub>2</sub> From Exhausts Emissions with a Solution of Potassium Phosphate</b> Fiaschi D., Pellegrini G. Volume 3, Page 1685
14:50	<b>Splitting the Exergy Destruction into Endogenous and Exogenous Parts - Application to Refrigeration Machines</b> Morosuk T., Tsatsaronis G. Volume 1, Page 165	<b>Synthesis, Design and Operation Optimization of a Marine Energy System</b> Dimopoulos G.G., Kougioufas A.V., Frangopoulos C.A. Volume 2, Page 533	<b>Toward the Optimization of ZEITMOP Cycle</b> Yantovski E., Gorski J., Warchol R. Volume 2, Page 913	<b>Analysis of the Effects of Combining Air Separation with Combustion in a Zero Emissions (ZEITMOP) Cycle</b> Foy K., McGovern J. Volume 3, Page 1693
15:10	<b>The "Cycle Method" used in the Exergy Analysis of Refrigeration Machines: From Education to Research</b> Morosuk T., Tsatsaronis G. Volume 1, Page 157		<b>A Parametric Investigation of Hydrogen HCCI Combustion Using a Multi-Zone Model Approach</b> Komninos N.P., Hountalas D.T., Rakopoulos C.D. Volume 2, Page 1045	<b>Environmental Benefits of Microgrids Operation</b> A.G. Tsikalakis, N.D. Hatzigiorgiou  Not in the proceedings due to late submission of final
15:30	<i>Coffee</i>			

Room:	MINOS	ARIADNE A'	ARIADNE C'	APOLLO A'
16:00	<b>Thermodynamics, Exergy and Second-Law Analysis II</b> Chair: N. Lior Co-chair: M. Halmann	<b>Diagnostics and Maintenance of Energy Systems</b> Chair: E. Bazzo Co-chair: C. Torres	<b>Energy Use in Buildings</b> Chair: A. Stanatelos Co-chair: S.N. Tay	
16:00	<b>Exergy Destruction Due to Friction in Heat Exchangers - A Refrigeration System Case Study</b> Dobrovicescu A., Tsatsaronis G. Volume 1, Page 173	<b>Prediction of the Fuel Impact Associated with Performance Degradation of the Components in a Power Plant</b> Verda V. Volume 2, Page 757	<b>Optimization of Thermal Performance of a Building with Ground Coupled Heat Pump System</b> Zogou O., Stamatelos A. Volume 2, Page 833	
16:20	<b>Energy and Exergy Analysis of Snøhvit- an LNG Processing Plant in Norway</b> Rian A.B., Lie H., Ertesvåg I.S. Volume 1, Page 183	<b>Non-Destructive Testing Applied for Risk Reduction in Petrochemical Installations</b> Nakomcic B., Basic D., Ciupinski L., Manaj W., Kurzydowski K.J. Volume 2, Page 767	<b>Waste Heat Recovery on Central Air Conditioning Systems in Hotel Buildings</b> Tay S.N., Ma T., Zheng A., Zhang W. Volume 2, Page 841	
16:40	<b>The Challenge of Introducing an Exergy Indicator in a Local Law on Energy</b> Favrat D., Marechal F., Epelly O. Volume 1, Page 191		<b>Phase Change Materials in Office Buildings: a Way to Save Exergy Losses</b> Cornelissen R.L., Tober E. Volume 2, Page 849	
17:00-18:15	<b>Panel Discussion: Exergy, Ecology and Economy</b> Moderator: An. Valero			

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08:30	<b>Energy Policy is Technology Politics – the Hydrogen Energy Case</b> Winter C.-J. Volume 1, Page 21			
09:15	<b>Combustion Advances in Automotive Engines</b> Alkidas A.C. Volume 1, Page 31			
10:00	<i>Coffee</i>			
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10:30	<b>Energy and Economic Evaluation of a Hybrid CAES/Wind Power Plant with Neural Network-based Wind Speed Forecasting</b> Arsie I., Marano V., Rizzo G., Savino G., Moran M. Volume 3, Page 1461	<b>System Analysis of the Energy Management of a Chemical Plant – Part II Applications</b> Ziebig A., Galus S. Volume 2, Page 623	<b>Availability Analysis of Hydrogen/Natural Gas Blends Combustion in Internal Combustion Engines</b> Rakopoulos C.D., Scott M.A., Kyritsis D.C., Giakoumis E.G. Volume 2, Page 983	<b>Modelling of a Spark Ignition Engine for Power-Heat Production Optimization</b> Descieux D., Feidt M. Volume 3, Page 1137
10:50	<b>Economic Comparison of Small Solar-Powered Desalination Plants</b> Fiorini P., Mardarella C., Sciubba E. Volume 3, Page 1469	<b>Energy Analysis of a Blast Furnace System operating with the COREX Process and CO<sub>2</sub> Removal</b> Ziebig A., Lampert K., Szega M. Volume 2, Page 671	<b>Knock Investigation by Flame and Radical Species Detection in Spark Ignition Engine for Different Fuels</b> Merola S.S., Vaglieco B.M. Volume 2, Page 991	<b>Energy Analysis of Biomass Power and Heat Plants Using Organic Rankine Cycle (ORC)</b> Drescher U., Lang K., Brüggemann D. Volume 3, Page 1145
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11:30	<b>An Enhanced Peak Shaving Method for Short Term Hydrothermal Scheduling</b> Simopoulos D.N., Kavatzas S.D., Vournas C.D. Volume 3, Page 1525	<b>A New Process for Recovering C<sub>2</sub>+ Hydrocarbon from Liquefied Natural Gas</b> Yong-Qiang Xiong, Ben Hua. Volume 2, Page 645	<b>The Effect of Compression Ratio on Exhaust Emissions from a PCCI Diesel Engine</b> Laguitton O., Crua C., Cowell T., Heikal M.R., Gold M.R. Volume 2, Page 1007	<b>Exergetic Evaluation of CHP Plant by the Use of Spread Sheet Software Tool</b> Rašković P., Gradimir I., Stoiljković S. Volume 3, Page 1193
11:50	<b>Transportable Compressed Air Energy Storage (T-CAES) System Driven by a 2,500-kW Wind Turbine</b> Enis B., Lieberman P., Rubin I., van der Linden S. Volume 3, Page 1533	<b>Maximum Power from Membrane Mixing Processes</b> Sorin M., Rheault F. Volume 2, Page 659	<b>Experimental Investigation and Combustion Analysis of a Direct Injection Dual-Fuel Diesel-Natural Gas Engine</b> Carlucci A.P., de Risi A., Laforgia D., Naccarato F. Volume 2, Page 1025	<b>Evaluating an Electricity Base Load Engine Cogeneration System – Electricity, Steam and Hot Water – through a Computational Simulation Methodology</b> do Espirito Santo D.B. Volume 3, Page 1169
12:10		<b>Comparison of Shaft and Flash Smelting Processes of Copper Production Using Thermo-Ecological Cost Method</b> Boryczko B., Donizak J., Holda A., Kolenda Z., Norwicz J. Volume 2, Page 663		
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14:45		<b>Heat Recovery in the Sodium Trypoliphosphate Manufacture Accomplished by Flue Gas Recirculation – Part I Methodology</b> Raškovic P. Volume 2, Page 699	<b>Comparative Study on Different IGCC Systems with Quasi-Zero CO<sub>2</sub> Emission</b> Duan L., Yang Y., Lin R. Volume 2, Page 947	<b>Cost Effective Operation of Boiler Plant with Embedded Gas Engine Cogeneration Module</b> Kalina J., Skorek J. Volume 3, Page 1201
15:05		<b>Heat Recovery in the Sodium Trypoliphosphate Manufacture accomplished by Flue Gas Recirculation – Part II Applications</b> Raškovic P. Volume 2, Page 707	<b>Biodiesel Fuel in Diesel Micro Turbine Engine: Modeling and Experimental Evaluation</b> Nascimento M.A.R., Lora E.S., Corrêa P.S.P., Andrade R.V., Rendon M.A., Venturini O.J. Volume 2, Page 957	<b>Cash Flow forecasting by using Time Series Methods in Geothermal District Heating Systems: Balcova – Narlidere Case</b> Erdogmus B.A., Ozerdem B. Volume 3, Page 1239
15:25		<b>Integration of Fired Heaters into Total Site</b> Varghese J., Bandyopadhyay S. Volume 2, Page 715	<b>Effect of Steam Injection on Microturbine Efficiency and Performance</b> Delattin F., Bram S., Knoop S., De Ruyck J. Volume 2, Page 965	<b>Heat Load Factor for Geothermal District Heating System Design</b> Yildirim N., Gökçen G. Volume 3, Page 1245
15:45	<i>Coffee</i>			
16:15	<b>Panel Discussion: Optimization of the Structure of Energy Systems</b> Moderators: A. Lazzaretto E. Siubba			
17:30 - 18:00	<b>Presentation of ECOS 2007</b> A. Mirandola <b>Closing of the Conference</b>			

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