

Personal information

Name: Eleni Heracleous
Research ID: 57184007300 (Scopus)
0000-0002-4574-9643 (ORCID)
Telephone: (+30) 2310 807578
E-Mail: e.heracleous@ihu.edu.gr



Current positions

2013 – to-date Collaborating Faculty Member, Laboratory of Environmental Fuels & Hydrocarbons (LEFH)
Chemical Process & Energy Resources Institute (CPERI)
Centre for Research and Technology Hellas (CERTH)

2020 – to-date Associate Professor in Catalytic Processes for the Production of Fuels and Chemicals
Department of Science & Technology, School of Science & Technology
International Hellenic University (IHU)

Previous positions

2016 – 2019 Assistant Professor in Energy Systems and Renewable Energy Sources
School of Science & Technology, International Hellenic University (IHU)

2013 – 2015 Lecturer in Energy Systems and Renewable Energy Sources
School of Science & Technology, International Hellenic University (IHU)

2009 – 2013 Collaborating Research Scientist
Laboratory of Environmental Fuels & Hydrocarbons (LEFH)
Chemical Process & Energy Resources Institute (CPERI)
Centre for Research and Technology Hellas (CERTH)

2006 – 2008 Marie Curie Post-Doctoral Fellow
Shell Global Solutions (Deutschland) GmbH, Hamburg, Germany

2000 – 2005 Ph.D. student
Department of Chemical Engineering, Aristotle University of Thessaloniki

Education

2000 – 2005 Ph.D. in Chemical Engineering (Excellent)
Aristotle University of Thessaloniki, Department of Chemical Engineering
Thesis title: “Novel selective catalytic process for the production of ethylene”
Supervisor: Professor Angeliki A. Lemonidou

1995 – 2000 Dipl.-Ing. in Chemical Engineering (Graduation grade: 8.2/10)
Department of Chemical Engineering, Aristotle University of Thessaloniki

Teaching activities

Teaching of the following master courses at the MSc programs “Energy Systems”, “Energy Management” and “Energy Building Design” of the School of Science & Technology at the International Hellenic University

2015 – to-date Principles of Energy Technology
2015 – to-date Fuels and Energy Conversion
2015 – to-date Alternative Fuels
2015 – to-date Environmental Assessment

Student supervision

- 2019 – to-date Main Supervisor of 3 Ph.D. Theses at the School of Science & Technology, International Hellenic University
1. **Flora Papadopoulou**, “Advanced catalytic processes for the upgrading of heavy bio-, waste- and fossil-derived liquids to high-quality products”, In progress since April 2022
 2. **Vasiliki Koidi**, “Intensified sorption-enhanced methanol synthesis from CO₂ with in-situ water sorption”, In progress since January 2019
 3. **Michalis Vassou**, “Catalytic upgrading of waste-derived bio-oil to high quality fuels”, In progress since October 2019
- 2018 – to-date Member of 3-member Advisory Committee in 4 Ph.D. Theses
1. **Ehsan Mahmoudi**, “Valorizing pyrolysis gases back to monomers via catalytic processes”, Department of Chemical Engineering, Aristotle University of Thessaloniki, In progress since January 2022
 2. **Savvas Koltsakidis**, “Multidisciplinary design optimization and properties investigation of novel catalytic structures, fabricated by Additive Manufacturing technologies”, School of Science & Technology, International Hellenic University, In progress since February 2021
 3. **Maria Tasioula**, “Catalytic oxidative dehydrogenation of ethane coupled with CO₂ utilization”, Department of Chemical Engineering, Aristotle University of Thessaloniki, In progress since October 2020
 4. **Theodoros Papalas**, “Experimental and computational investigation of CaO carbonation cycles with application in sorption-enhanced H₂ production and in CO₂ capture from industrial flue gases”, Department of Chemical Engineering, Aristotle University of Thessaloniki, In progress since December 2018

Institutional responsibilities

- 2016 – to-date Director and Scientific Responsible of the MSc programs “Energy Systems” and “Energy Building Design”
- 2014 – to-date Member of the General Assembly of the School of Science & Technology, International Hellenic University
- 2014 – to-date Member of the Student Applications’ Evaluation Committee of the School of Science & Technology, International Hellenic University
- 2020 – 2021 Dean of the School of Science & Technology, International Hellenic University
- 2020 – 2021 Head of the Department of Science & Technology, International Hellenic University
- 2020 – 2021 Board member of the Governing Board of the University Center of International Programmes of Studies (UCIPS) of the International Hellenic University
- 2020 – 2021 Board member of the Postgraduate Studies Committee of the International Hellenic University
- 2020 – 2021 Board member of the Students Affairs Committee of the International Hellenic University
- 2015 – 2020 Head of the Erasmus+ Committee of the School of Science & Technology, International Hellenic University
- 2014 – 2020 Member of the Internal Evaluation Committee of the School of Science & Technology, International Hellenic University
- 2018 – 2019 Board member of the Center of Continuing Education and Lifelong Learning, International Hellenic University
- 2016 – 2019 Board member of the Research Committee, International Hellenic University
- 2014 – 2019 Representative of the International Hellenic University at the National Organization for the Certification of Qualifications & Vocational Guidance (EOPPEP)

Commissions of Trust

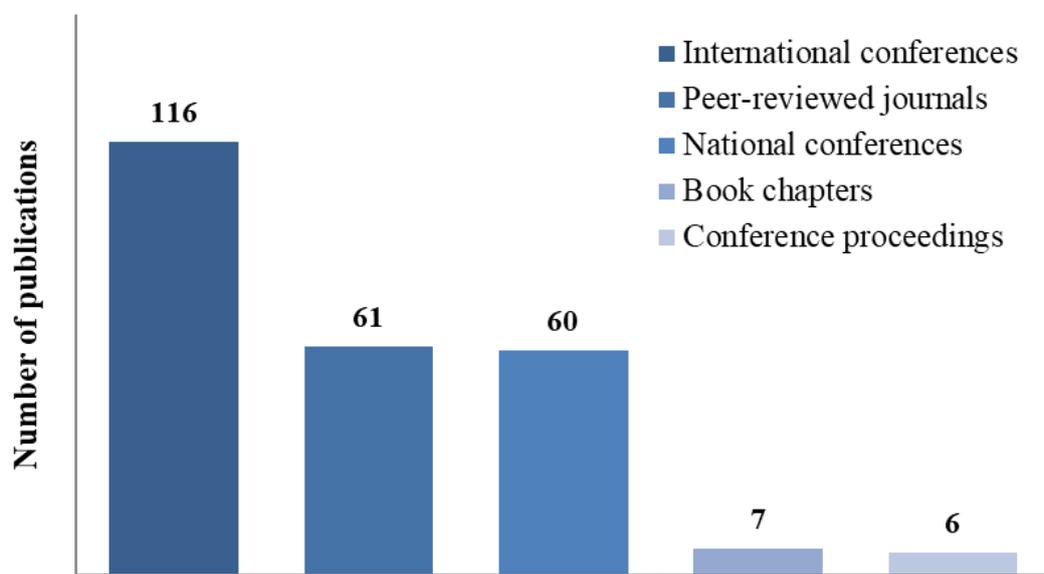
- 2021 Guest Editor of Special Issue “Proceedings of the V International Conference Catalysis for Renewable Sources: Fuel, Energy, Chemicals”, Catalysis Today, Volume 379, Pages 1-296 (November 2021)
- 2017 Guest Editor of Special Issue “Advances in catalytic biomass fast pyrolysis and bio-oil upgrading”, Biomass Conversion and Biorefinery, Volume 7, Issue 3 (September 2017)

2014	Guest Editor of Special Issue “Advances in Catalysis for Biomass Valorization”, Applied Catalysis B: Environmental, Volume 145, Pages 1-222 (February 2014)
2016 – to-date	Evaluator of research proposals in H2020 (H2020-MSCA-PF-2021, H2020-MSCA-IF-2018, H2020-MSCA-RISE-2018, H2020-MSCA-IF-2017, H2020-MSCA-IF-2016)
2016 – to-date	Member of 7-member examination committees for Ph.D. theses at the Aristotle University of Thessaloniki and the University of Western Macedonia
2000 – to-date	Reviewer in more than 20 highly esteemed peer review scientific journals
2014 – 2018	Substitute national representative at the COST action FP1306 «Valorization of lignocellulosic biomass side streams for sustainable production of chemicals, materials & fuels using low environmental impact technologies»
2014 – 2018	Substitute national representative at the COST action TU1401 «Renewable energy and landscape quality (RELY)»
2013	Evaluator in the call for research infrastructure Hercules of the University of Ghent, Belgium

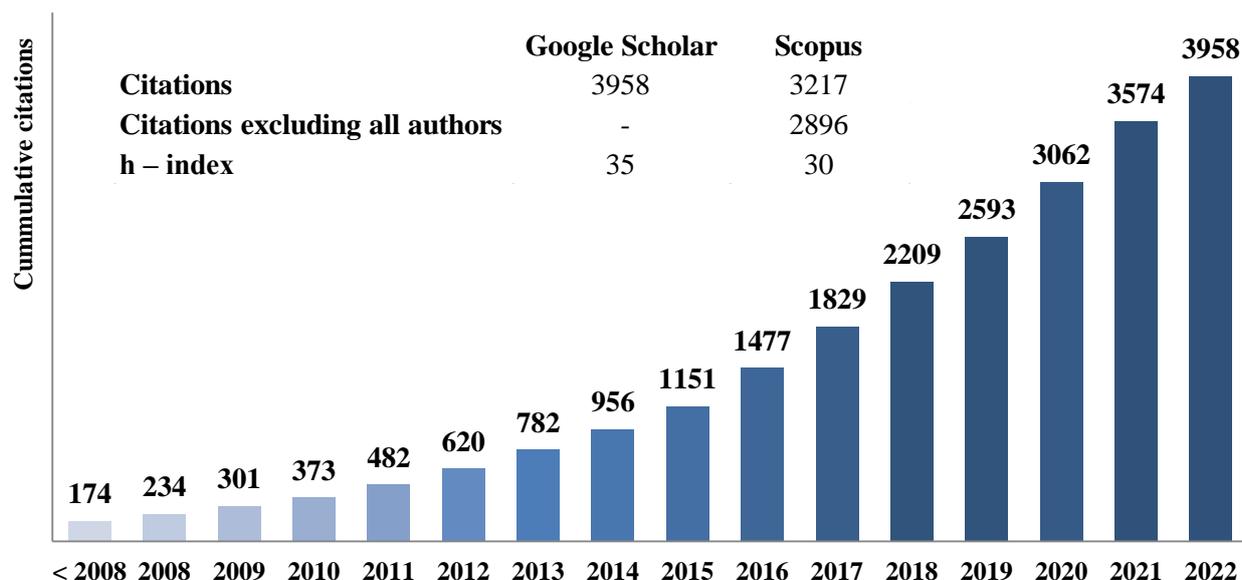
Research Interests

- Conversion of CO and CO₂ to high-added value fuels and chemicals via catalytic processes
- Conversion of biomass and biomass-derived streams to high quality fuels and chemicals via catalytic thermochemical processes
- Valorization of light alkanes to high added value petrochemicals via catalytic selective oxidation processes
- CO₂ capture from stationary emission sources via carbonate looping and chemical looping
- Intensification of natural gas reforming processes for the reduction of energy demands and the increase of hydrogen yield
- Environmental assessment of biomass-to-fuels/chemicals conversion chains via Life Cycle Analysis (LCA)

Research output



Impact of research output



A/A	Journal	No of publications	Impact Factor 2021
1	Angewandte Chemie International Edition	1	15.336
2	ACS Catalysis	1	13.084
3	Applied Catalysis B: Environmental	3	19.503
4	Journal of Catalysis	8	7.920
5	ChemSusChem	2	8.928
6	Applied Energy	2	9.746
7	Chemical Engineering Journal	4	13.273
8	Catalysis Science & Technology	3	6.119
9	Journal of CO ₂ Utilization	1	7.132
10	ChemCatChem	2	5.686
11	Physical Chemistry Chemical Physics	2	3.676
12	Catalysis Today	10	6.766
13	International Journal of Greenhouse Gas Control	1	3.738
14	Applied Catalysis A: General	6	5.706
15	Molecular Catalysis	2	5.062
16	Fuel Processing Technology	1	7.033
17	Biomass & Bioenergy	1	5.061
18	International Journal of Hydrogen Energy	2	5.816
19	Energy & Fuels	2	3.605
20	Chemical Engineering Science	1	4.311
22	Industrial & Engineering Chemistry Research	2	3.720
22	Catalysis Letters	1	3.186
23	Biomass Conversion & Biorefinery	2	4.987
TOTAL		61	459.975

Funded projects as Coordinator and Principle Investigator

- Principal Scientific Investigator in the H2020 EU project “**BlackCycle - For the Circular Economy of Tyre Domain: Recycling End of Life Tyres into New Tyres**”, EU Innovation Action Project CE-SC5-07-2018-2019-2020, Grant Agreement No: 869625. Total Budget: 15.998.301,25€. Own Budget: 711.350€ - 2020-2023
- Principal Scientific Investigator in the national project “**3DInnovaCat - Innovative Catalyst Design via 3D Printing**” funded in the frame 1st Call for H.F.R.I. Research Projects for the Support of Faculty

Members and Researchers and the Procurement of high-cost Research Equipment, HFRI-FM17-62. Total Budget: 190,000.00€ - 2020-2023

- Principal Scientific Investigator in the H2020 EU project “**Sustainable Drop-In Transport fuels from Hydrothermal Liquefaction of Low Value Urban Feedstocks**” funded by the EU in the frame of the call LC-SC3-RES-21-2018, GA No 818413. Total Budget: 5.074.876,25€. Own Budget: 891.250,00€ - 2018-2022
- Coordinator of Scientific Activities and Principal Scientific Investigator in the national project “**Novel intensified processes for CO₂ capture and conversion to methanol – CO₂MeOH**” funded in the frame of the call “Ereunw-Dimiourgw-Kainotomw” for the collaboration between industries and research organizations. Total Budget: 999.760,00€. Own Budget: 244.730,00€ - 2018-2021
- Principal Scientific Investigator in the national project “**Valorization of oil refinery liquid waste with simultaneous glycerol recycling from biodiesel industries towards the production of (1) high added value PROPylene and (2) glycerides via EsteRification for the synthesis of biodiesel – ProperDiesel**” funded in the frame of the call “Ereunw-Dimiourgw-Kainotomw” for the collaboration between industries and research organizations. Total Budget: 957.602,50€. Own Budget: 65.960,00€ - 2018-2021
- Co-coordinator of the H2020 project “**Sustainable and efficient bio-chemical catalytic cascade conversion of residual biomass to high quality biopolymers**” funded by the EU in the frame of the call H2020-NMBP-2016-2017, BIOTEC-06-2017. Total Budget: 5.693.145,00€. Own Budget: 1.316.250,00€ - 2018-2020

Project participation as main research scientist

- “i3upgrade - Integrated and intelligent upgrade of carbon sources through hydrogen addition for the steel industry”, EU RFCS-2017 Project, GA 800659, 6/2018 – 12/2021
- “DIRPRIMCOAL - Direct Primary Coal Liquefaction via an Innovative Co-processing Approach with Waste and Petroleum Feedstocks”, EU RFCS-2015 Project, GA 709493, 7/2016 – 7/2019
- “CASCATBEL - CAScade deoxygenation process using tailored nanoCATalysts for the production of BiofuELs from lignocellulosic biomass”, EU FP7-NMP-2013-LARGE-7, 2014-2017
- “WAVES - WASTE bio-feedstocks hydro-Valorisation processes”, CAPITA-ERANET, GSRT, 2013-2015
- “Minerals for Sustainable cost and energy efficient chemical looping combustion technology”, FENCO-ERANET, GSRT, 2013-2015
- “Exploring novel routes for CO₂-free fossil fuel combustion”, National Action ‘COOPERATION 2011 - Partnerships of Production and Research Institutions in Focused Research and Technology Sectors’, Ministry of Education, Lifelong Learning and Religious Affairs, 2013-2016
- “Intensifying methane reforming by combining carbonate and chemical looping”, NPRP 5-420-2-166, funded by the Qatar National Research Fund (QNRF), 2012-2015
- “Glycerol2Energy: Production of energy carriers from biomass by-products”, National Action ‘Thales’, Greek Ministry of Education and E.U./European Social Fund, Operational Program “Education and Lifelong Learning (EDULLL), 2012-2016
- “BRISK - The European Research Infrastructure for Thermochemical Biomass Conversion”, Combination of EU Collaborative Project & Coordination and Support Actions FP7-INFRASTRUCTURES-2011-1, 2011-2015
- “EuroBioRef - EUROpean multilevel integrated BIOREFinery design for sustainable biomass processing”, EU Collaborative Project FP7-2009-BIOREFINERY_CP, 2010-2014
- “Optimized Fuels for Sustainable Transport in Europe”, EU Collaborative Project ENERGY.2007.3.2.5: Synthetic biofuels via gasification, 2008-2012
- “Alkanes to light olefins via novel catalysts and process schemes: AL2OL”, ACENET-ERANET 1st Call for Proposals, Contract No: ACE.07.003, General Secretariat of Research and Technology, 2009-2012
- “Novel efficient catalysts for bio-syngas conversion to C2-C4 alcohols: GAS2ALCO”, Marie-Curie European Reintegration Grant (ERG), Contract No: PERG04-GA-2008-235058, 2009-2012

- “CO₂ reduction through automotive bio-component & sustainable step changes in fuels and lubricants performance: SUSTAINABLE FUELUBE”, Marie-Curie Host Fellowship for the Transfer of Knowledge (ToK), Industry-Academia Partnership Scheme, Contract No: MTKI-CT-2004-509777, 2006-2008
- “Novel selective catalytic processes for the production of ethylene and propylene”, National Research Programme supported by the General Secretariat for Research and Technology (GSRT) Hellas, 2003-2006
- “Novel nanoscopically tailored cracking catalysts for the efficient production of ethene and propene”, Greek-German Joint Research and Technology Programme supported by the General Secretariat for Research and Technology (GSRT) Hellas, 2002-2004

Major Relevant Publications

1. **E. Heracleous***, V. Koidi, A.A. Lappas, A. Hauser, S. Haag, “Valorization of steel-work off-gases: Influence of impurities on the performance of Cu-based methanol synthesis catalyst”, *Chemical Engineering Journal* 444 (2022) 136571 – [Citations: 1](#)
2. **E. Heracleous***, V. Koidi, A.A. Lappas, “CO₂ conversion over Cu-Mo₂C catalysts: Effect of the Cu promoter and preparation method”, *Catal. Sci. Technol.* 11 (2021) 1467 – 1480 – [Citations: 5](#)
3. A. Antzaras, **E. Heracleous**, A.A. Lemonidou, “Hybrid catalytic materials with CO₂ capture and oxygen transfer functionalities for high-purity H₂ production”, *Catalysis Today* 369 (2021) 2 – 11 – [Citations: 8](#)
4. A. Zachopoulos, **E. Heracleous***, “Overcoming the equilibrium barriers of CO₂ hydrogenation to methanol via water sorption: a thermodynamic analysis”, *Journal of CO₂ Utilization* 21 (2017) 360-367 – [Citations: 49](#)
5. E.Th. Liakakou, M.A. Isaacs, K. Wilson, A.F. Lee, **E. Heracleous***, “On the Mn promoted synthesis of higher alcohols over Cu derived ternary catalysts”, *Catalysis Science & Technology* 7 (2017) 988 – 999 – [Citations: 29](#)
6. P. Lanzafame, L. Perathoner, G. Centi, **E. Heracleous***, E.F. Iliopoulou, K.S. Triantafyllidis, A.A. Lappas, “Effect of the structure and mesoporosity in Ni/zeolite catalysts for the hydroisomerization/hydrocracking of n-hexadecane”, *ChemCatChem* 9 (2017) 1632-1640 – [Citations: 32](#)
7. E.T. Liakakou, **E. Heracleous***, “Transition metal promoted K/Mo₂C as efficient catalysts for CO hydrogenation to higher alcohols”, *Catalysis Science & Technology* 6 (2016) 1106 – 1119 – [Citations: 34](#)
8. E.T. Liakakou, **E. Heracleous***, K.S. Triantafyllidis, A.A. Lemonidou, “K-promoted NiMo catalysts supported on activated carbon for the hydrogenation reaction of CO to higher alcohols: Effect of support and active metal”, *Applied Catalysis B: Environmental* 165 (2015) 296 – [Citations: 77](#)
9. **E. Heracleous***, E.T. Liakakou, A.A. Lappas, A.A. Lemonidou, “Investigation of K-promoted Cu-Zn-Al, Cu-X-Al and Cu-Zn-X (X=Cr, Mn) catalysts for carbon monoxide hydrogenation to higher alcohols”, *Applied Catalysis A: General* 455 (2013) 145 – [Citations: 92](#)
10. **E. Heracleous***, E.F. Iliopoulou, A.A. Lappas, “Micro-mesoporous Pt/ZSM-5 Catalysts for the Hydroisomerization of BTL-naphtha”, *Industrial & Engineering Chemistry Research* 52 (2013) 14567 – [Citations: 25](#)

Guest Editorships

- Guest Editor of Special Issue “Proceedings of the V International Conference CATALYSIS FOR RENEWABLE SOURCES: FUEL, ENERGY, CHEMICALS”, *Catalysis Today*, Volume 379, Pages 1-296 (November 2021)
- Guest Editor of Special Issue “Advances in catalytic biomass fast pyrolysis and bio-oil upgrading”, *Biomass Conversion and Biorefinery*, Volume 7, Issue 3 (September 2017)
- Guest Editor of Special Issue “Advances in Catalysis for Biomass Valorization”, *Applied Catalysis B: Environmental*, Volume 145, Pages 1-222 (February 2014)

Prizes/Awards

- **Young Scientist Award 2012** - Awarded by the International Association of Catalysis Societies in recognition of the excellent scientific contribution presented as main author at the 15th International Congress on Catalysis in Munich, Germany
- **Marie Curie Grant** - Reintegration grant in the frame of the European Scheme “Marie-Curie European Reintegration Grants, Support for training and career development of researchers” 2009-2012
- **Marie Curie Fellowship** - Post-doctoral scholarship in the frame of the European Scheme Marie-Curie Host Fellowships for the Transfer of Knowledge (ToK), Industry-Academia Partnership Scheme 2006-2008
- **Scholarship for Training & Specialization** – CPERI/CERTH 2000-2002
- **State Scholarships Foundation (IKY) Scholarship** for excellent academic performance 1995

Invited Lectures

- Invited Lecture entitled “Catalysis in downstream processing for the cascade production of high added value biochemicals and biofuels” at the European Congress on Catalysis XIV, Aachen (Germany), **August 18-23, 2018**.
- Invited Lecture entitled “The project H2020 BioCatPolymers: Production of Bioplastics from Residual Biomass” at the event “Environmentally conscious forum” organized by TUV Austria Hellas, Athens (Greece), **October 9, 2018**.
- Invited Lecture entitled “Biomass conversion to aviation biofuels: catalytic CO hydrogenation to higher alcohols” at UCCS (Unité de Catalyse et de Chimie du Solide) of the University of Lille, Lille (France), **January 16, 2017**.
- Invited Lecture entitled “Thermochemical route for biomass conversion to aviation biofuels: catalytic CO hydrogenation to higher alcohols” at the workshop «RESTOENE-2» organized by the research center IMDEA Energy, Madrid (Spain), **June 2 – 3, 2016**.
- Invited Lecture entitled “Production of high-quality bio-oil via fast biomass pyrolysis coupled with ketonization” at the workshop «Thermochemical Lignocellulose Conversion Technologies» co-organized by CPERI/CERTH and the Technical University of Hamburg-Harburg, Porto Carras (Greece), **May 18-20, 2016**.
- Invited Lecture entitled “Effect of mesoporosity and acidity on the hydroconversion of n-hexadecane over Pt/ZSM-5 catalysts” at the workshop «Hydrotreatment for the processing of renewable oils» organized by the University of Ghent, Ghent (Belgium), **February 25, 2016**.
- Invited Lecture entitled “Upgrading of bio-oil via vapor phase ketonization” at the European workshop «Nanoporous Materials and Sustainable Production of Biofuels and Biochemicals» co-organized by ENMIX, FASTCARD, CASCATBEL, BIOGO, Stuttgart (Germany), **January 20-21, 2016**.
- Invited Lecture at the Institute of Catalysis of the Technical University of Munich, **December 19, 2014**.
- Invited instructor at the educational seminar series “Introduction to Instrumental Analysis Techniques”, organized by the Dept of Chemical Engineering, AUTH, in the frame of postgraduate and Ph.D. students training seminars. Covered topic: “Characterization of solid catalysts via temperature-programmed methods” (1h), **April 12, 2010**.
- Invited instructor at the educational seminar series “Bioenergy and Biofuels” (80 hours), organized by the Centre of Research and Technology Hellas (CERTH) in the frame of the project Networks for Research and Technology Training. Covered topic: “Biofuels and Environment” (6h), **February 29, 2008**.
- Invited instructor at the educational seminar series “Utilization of biomass for the production of alternatives fuels and high-added value chemicals”, co-organized by the Aristotle University of Thessaloniki (AUTH) and the Centre of Research and Technology Hellas (CERTH) in the frame of the project Networks for Research and Technological Training. Covered topics: “Evaluation of the environmental impacts of biofuels via Life Cycle Analysis” (5h), **December 7, 2007**.