



June 13-15, 2011

**International Conference**  
on Advanced Research and  
Applications in Mechanical  
Engineering

# CONFERENCE PROGRAM



Wayne State University  
Detroit, Michigan, USA



# Foreword

The sponsoring institutions, Wayne State University and Notre Dame University-Louaize, along with the Conference Organizing Committee would like to welcome you to the 2011 International Conference on Advanced Research and Applications in Mechanical Engineering (ICARAME'11), which will be held on the main campus of Notre Dame University-Louaize in Zouk Mosbeh, Lebanon.

The conference will serve as an excellent forum for international scholars to exchange and discuss their latest research findings. It will feature three keynote speeches by world renowned speakers and parallel tracks of technical sessions.

The conference will feature also a very rich social program to enjoy the local culture including daily visits to wonderful sightseeing sites and dinners in restaurant to taste the delicious Lebanese foods. Our goal is to make your stay unforgettable and we hope we will see you again in a next edition of the same conference.

This foreword would be incomplete without acknowledgements. We are grateful to all people, whether at Notre Dame University-Louaize or Wayne State University, who made this event a reality. We are thankful to our institutions for their commitment to the success of the event. We are also indebted to the Lebanese National Council for Scientific Research<sup>(1)</sup> for its generous contribution and to our sponsors, both gold (Petrofac Ltd.) and silver (MSC Software Inc.), for their unconditional trust and support.

We are very excited about this conference and we look forward to meeting you at ICARAME'11.

Nabil Chalhoub, Co-Chair  
Wayne State University

Michel Hayek, Co-Chair  
Notre Dame University-Louaize

<sup>(1)</sup> The National Council for Scientific Research (CNRS) was established by virtue of a law issued on 14 September 1962 that was further amended by decree no. 13666 dated August 23, 1963, law no 8/66 dated February 2, 1966 and law no 576 dated February 11, 2004.

The CNRS promotes and oversees research and related activities in Lebanon. In this respect, the CNRS maintains Research Centers, funds individual research projects, sponsors various task forces, and is engaged in continuous scientific programs. The CNRS is also engaged in bilateral research funding.

The four research centers run by the CNRS are (a) the Center for Geophysical Research (CRG), (b) the Center for Marine Sciences (CRM), (c) the Center for Remote Sensing (CRS), and (d) the Lebanese Atomic Energy Commission (CLEA).

## Keynote Speakers



**Prof. Ali Nayfeh**

University Distinguished Professor Emeritus  
Department of Engineering Science and Mechanics  
Virginia Polytechnic Institute and State University (VirginiaTech)



**Prof. Charbel Farhat**

Vivian Church Hoff Professor of Aircraft Structures  
Chairman, Department of Aeronautics and Astronautics  
Director, Army High Performance Computing Research Center  
Department of Mechanical Engineering & Institute for  
Computational and Mathematical Engineering  
Stanford University



**Prof. Naeim Henein**

Director of the Center for Automotive Research  
Mechanical Engineering Department  
Wayne State University

## ICARAME'11: Schedule Overview

<b>Sunday June 12</b>	5:00 PM - 6:00 PM	<b>Registration</b> Conference Business Center	
	6:00 PM - 7:30 PM	<b>Welcome Reception</b> University Restaurant	
<b>Monday June 13</b>	8:00 AM - 9:00 AM	<b>Registration</b> Conference Business Center	
	9:00 AM - 10:00 AM	<b>Opening Ceremony</b> Issam Fares Hall	
	10:00 AM - 11:00 AM	<b>Keynote Lecture I</b> <b>Prof. Ali Nayfeh</b> Issam Fares Hall	
	11:00 AM - 11:30 AM	<b>Coffee Break</b> Conference Business Center	
	11:30 AM - 1:30 PM	Track I <b>Technical Session M1A:</b> <b>Engines &amp; Combustion</b> Issam Fares Hall	Track II <b>Technical Session M1B:</b> <b>Mechanics</b> Pierre Abu Khater Hall
	1:30 PM – 2:30 PM	<b>Lunch</b> University Restaurant	
	2:30 PM – 4:30 PM	Track I <b>Technical Session M2A:</b> <b>Heat Transfer</b> Issam Fares Hall	Track II <b>Technical Session M2B:</b> <b>Systems &amp; Modeling I</b> Pierre Abu Khater Hall
	4:30 PM – 11:00 PM	<b>Social Event I</b>	
<b>Tuesday June 14</b>	8:00 AM - 9:00 AM	<b>Registration</b> Conference Business Center	
	9:00 AM - 10:00 AM	<b>Keynote Lecture II</b> <b>Prof. Charbel Farhat</b> Issam Fares Hall	
	10:00 AM - 10:30 AM	<b>Coffee Break</b> Conference Business Center	
	10:30 AM - 12:30 PM	Track I <b>Technical Session T1A:</b> <b>Fluid Dynamics I</b> Issam Fares Hall	Track II <b>Technical Session T1B:</b> <b>Controls &amp; Robotics</b> Pierre Abu Khater Hall
	12:30 PM – 1:30 PM	<b>Lunch</b> University Restaurant	
	1:30 PM – 3:30 PM	Track I <b>Technical Session T2A:</b> <b>Fluid Dynamics II</b> Issam Fares Hall	Track II <b>Technical Session T2B:</b> <b>Systems &amp; Modeling II</b> Pierre Abu Khater Hall
	3:30 PM – 11:00 PM	<b>Social Event II</b>	

<b>Wednesday June 15</b>	8:00 AM - 9:00 AM	<b>Registration</b> Conference Business Center	
	9:00 AM - 10:00 AM	<b>Keynote Lecture III</b> <b>Prof. Naeim Henein</b> Issam Fares Hall	
	10:00 AM - 10:30 AM	<b>Coffee Break</b> Conference Business Center	
	10:30 AM - 12:30 PM	Track I <b>Technical Session W1A:</b> <b>Materials Sciences</b> Issam Fares Hall	Track II <b>Technical Session W1B:</b> <b>Dynamics &amp; Vibration</b> Pierre Abu Khater Hall
	12:30 PM – 2:00 PM	<b>Lunch &amp; Closing Ceremony</b> University Restaurant	
	2:00 PM – 11:00 PM	<b>Conference Tour</b>	

**Sunday, June 12**

**5:00 PM - 6:00 PM**

***Registration***

**Conference Business Center**

**6:00 PM - 7:30 PM**

***Welcome Reception***

**University Restaurant**





## Monday, June 13

8:00 AM - 9:00 AM *Registration* Conference Business Center

9:00 AM - 10:00 AM *Opening Ceremony* Issam Fares Hall

9:00 Welcome Speech, Rev. Fr. Walid Moussa, President, Notre Dame University-Louaize, Lebanon

9:10 Welcome Speech, Dr. Ahmad Ezzeddine, Associate Vice President for Academic Outreach, Wayne State University, USA

9:20 Industry-University Relationships, Mr. Neemat Frem, President/CEO, INDEVCO Group, Lebanon

9:50 ICARAME'11 Orientation, Nabil Chalhoub & Michel Hayek, Co-Chairs

10:00 AM - 11:00 AM *Keynote Lecture I* Issam Fares Hall

Introduction by Raouf Ibrahim (Wayne State University, USA)

### *A Smart Sway Controller for Cranes-From Theory to Laboratory to Industry*

**Prof. Ali H. Nayfeh**

University Distinguished Professor Emeritus

Department of Engineering Science and Mechanics

Virginia Polytechnic Institute and State University (VirginiaTech)

11:00 AM - 11:30 AM *Coffee Break* Conference Business Center

11:30 AM - 1:30 PM *Track I - M1A: Engines & Combustion* Issam Fares Hall

*Co-Chairs: Marcis Jansons & Dinu Taraza* (Wayne State University, USA)

**11:30 - 11:50** *Analysis of Flow and Thermal Fields in HRSG of Yazd Combined Cycle Power Plant*, Mojtaba Dehghanzadeh, Ali Dehghan (Yazd University, Iran)

**11:50 - 12:10** *Simulation of Ionization in Diesel Engines Premixed Combustion*, Fadi Estefanous, Naeim Henein (Wayne State University, USA)

**12:10 - 12:30** *Experimental and Numerical Study of Venturi EGR System in a Dual Fuel Engine*, Amin Paykani (University of Tabriz, Iran), Rahim Khoshbakhti Saray (Sahand University of Technology, Iran), Mohammad Taghi Shervani Tabar (University of Tabriz, Iran)

**12:30 - 12:50** *Effect of Five Cycle Fuel Economy Label on Emissions and Fuel Economy of Hybrid Vehicles*, Mahmoud Yassine, Sashi Velnati (Chrysler Group LLC, USA)

**12:50 - 1:10 A CFD Study of the Effect of HCHO Addition on Autoignition and Combustion**, Radu Florea, Dinu Taraza, Marcis Jansons, Naeim Henein (Wayne State University, USA)

**1:10 - 1:30 Novel Implementation of Two-Color Soot Temperature Measurement in Optical Diesel Engine with High-speed CMOS Digital Color Camera**, Kan Zha, Marcis Jansons (Wayne State University, USA)

**11:30 AM - 1:30 PM**      **Track II - M1B: Mechanics**      **Pierre Abu Khater Hall**  
Co-Chairs: **Raouf Ibrahim** (Wayne State University, USA) & **Sami Masri** (University of Southern California, USA)

**11:30 - 11:50 Inelastic Impact Dynamics of Ships with One-Sided Barriers: Experimental Validation**, Raouf Ibrahim, Valery Pilipchuk, Ihab M. Grace (Wayne State University, USA)

**11:50 - 12:10 Buckling of FGM Cylindrical Shell under Radial and Axial Load in Thermal Environment**, Mohamad Taghi Ahmadi (Isfahan University of Technology, Iran)

**12:10 - 12:30 A Vision-Based Crack Detection Approach for Condition Assessment of Structures**, Mohammad Reza Jahanshahi, Sami F. Masri (University of Southern California, USA)

**12:30 - 12:50 Quasi-static Problem of Thermal Elasticity in Piecewise-Homogeneous Solid**, Vasiliy Tereschenko (National Taras Shevchenko University of Kiev, Ukraine)

**12:50 - 1:10 Large Deflection Analysis of Circular Pipes under Transverse Loading Using Multiple Shooting Method**, Seyed Amirreza Shahidi (Babol University of Technology, Iran)

**1:10 - 1:30 Stress Analysis of Functionally Graded Square Plate with Variable Thickness Subjected to Thermal Loading by Harmonic Differential Quadrature Method**, Maziar Janghorbana, Amin Zare (Islamic Azad University, Iran)

**1:30 PM - 2:30 PM**      **Lunch Break**      **University Restaurant**

**2:30 AM - 4:30 PM**      **Track I - M2A: Heat Transfer**      **Issam Fares Hall**  
Co-Chairs: **Mohammad Akhavan-Behabadi** (University of Teheran, Iran) & **Ali Dehghan** (Yazd University, Iran)

**2:30 - 2:50 An Empirical Study on Heat Transfer Characteristics of a Temperature Dependent Fluid inside Inclined Helically Coiled Tubes under Uniform Wall Temperature**, Mohammad Ali Akhavan-Behabadi, Mohammad Fakoor Pakdaman (University of Tehran, Iran)

**2:50 - 3:10 Experimental Investigation of the Effect of Exhaust Gas Recirculation and Pre-Heating of the Inlet Air on Performance and Emission Characteristics of Dual Fuel Engines at Part Loads**, Amin Paykani (University of Tabriz, Iran), Rahim Khoshbakhti Saray (Sahand University of Technology, Iran),

Mohammad Taghi Shervani Tabar, Asadollah Mohammadi Kousha (University of Tabriz, Iran)

**3:10 - 3:30** *Experimental Investigation of Two-Phase Flow Regimes during Condensation inside Inclined Microfin Tubes*, Mohammad Ali Akhavan-Behabadi, Saeed Mohseni (University of Tehran, Iran)

**3:30 - 3:50** *Heat Generation or Absorption Effects on Transient MHD Natural Convection Flow over a Sphere*, Mohammad Moghimi (Shahid Bahonar University of Kerman, Iran)

**3:50 - 4:10** *Performance of Parallel Flow Heat Exchanger with a Heat Source*, Mamdouh El Haj Assad (Aalto University School of Science and Technology, Finland)

**4:10 - 4:30** *Effects of Mode Transition on Heat Transfer Enhancement with Nanofluids in Rectangular Cavity*, Fairouz Belaid (Guelma University, Algeria)

**2:30 AM - 4:30 PM** *Track II - M2B: Systems & Modeling I* **Pierre Abu Khater Hall**

*Co-Chairs: Nabil Chalhoub* (Wayne State University, USA) & **Georges Fadel** (Clemson University, USA)

**2:30 - 2:50** *Prognostic Model for Buried Pipelines*, Seifedine Kadry (American University of the Middle East, Kuwait)

**2:50 - 3:10** *Indirect Measurement of Frictional and Loading Losses in Internal Combustion Engines*, Giscard Kfoury (Lawrence Technological University, USA), and Nabil Chalhoub (Wayne State University, USA)

**3:10 - 3:30** *Prediction Model for Cooling of an Electrical Unit with Time-Dependent Heat Generation*, Adil A. Alwan, and Rafel H. Hameed (University of Babylon, Iraq)

**3:30 - 3:50** *Modeling of Piston Secondary Motions with Piston-Ring-Liner Interactions*, Mohannad Hakeem, and Nabil G. Chalhoub (Wayne State University, USA)

**3:50 - 4:10** *Modeling and Control of Gust Loads on a Rotating Blade*, Y. Bichiou, M. Ghommem (Virginia Tech, USA), A. Nuhait (King Saud University, KSA), M. R. Hajj (Virginia Tech, USA)

**4:10 - 4:30** *A Model of Engineering Education to Prepare Engineers for the 21st Century*, Maria Vaz, Badih Jawad, Giscard Kfoury (Lawrence Technological University, USA)

**4:30 PM - 11:00 PM** *Social Event I*

**4:30 – 6:30** Break (Ride to and from the hotels according the shuttle bus schedule included in the conference bag)

**6:30 – 8:30** Sightseeing at Jbeil Old Souks and Castles

**8:30 – 10:30** Dinner at a local restaurant to be announced during the conference

**10:30** Ride to hotels



## Tuesday, June 14

8:00 AM - 9:00 AM *Registration* Conference Business Center

9:00 AM - 10:00 AM *Keynote Lecture II* Issam Fares Hall

Introduction by Charbel Bou Mosleh (Notre Dame University-Louaize, Lebanon)

### *Game-Changing Computational Engineering Technology*

**Prof. Charbel Farhat**

Vivian Church Hoff Professor of Aircraft Structures

Chair of the Department of Aeronautics and Astronautics

Director of the Army High Performance Computing Research Center

Department of Mechanical Eng. & Institute for Computational and Mathematical Eng.

Stanford University

10:00 AM - 10:30 AM *Coffee Break* Conference Business Center

10:30 AM - 12:30 PM *Track I - T1A: Fluid Dynamics I* Issam Fares Hall

*Co-Chairs:* Charbel Bou Mosleh (Notre Dame University-Louaize, Lebanon) & Joseph Majdalani (University of Tennessee Space Institute, USA)

**10:30 - 10:50** *CFD-Based Aerodynamic Analysis of a Battle-Induced Damaged F-16 Wing*, Charbel Bou-Mosleh (Notre Dame University-Louaize, Lebanon)

**10:50 - 11:10** *Numerical Simulation of Three Dimensional Dynamic Motion of a Standard NACA Model in an Impact Problem*, Amir Hossein Nikseresht, Hossein Ghazizade-Ahsae (Shiraz University of Technology, Iran)

**11:10 - 11:30** *Effects of Horizontal Tail Up Wash on the Wing Surface Pressure*, Mohammad Reza Soltani, Iman Bahman Jahromi (Sharif University of Technology, Iran)

**11:30 - 11:50** *Impulse-Based Vs. Lift-Based Vertical Axis Wind Turbines: CFD Predictions*, Michel Hayek (Notre Dame University-Louaize, Lebanon)

**11:50 - 12:10** *An Efficient Mesh-Less Method for Compressible Flow Calculations around 3D Geometries*, Alireza Jahangirian, Samad Sattarzadeh (Amirkabir University of Technology, Iran)

**12:10 - 12:30** *Numerical Solution of the Lubrication Equation Using Boundary Element Method*, Abdelkrim Aiad (University Saad Dahlab of Blida, Algeria)

10:30 PM - 12:30 PM *Track II - T1B: Control & Robotics* Pierre Abu Khater Hall

*Co-Chairs:* Giscard Kfoury (Lawrence Technological University, USA) & Nabil Sarhan (Wayne State University, USA)

**10:30 - 10:50** *Vehicular Multimedia and Communication Systems: Recent and Future Trends*, Nabil J. Sarhan (Wayne State University, USA)

- 10:50 - 11:10** *Robust Nonlinear Controller for a Spherical Robotic Manipulator*, Constantine Mastory, and Nabil Chalhoub (Wayne State University, USA)
- 11:10 - 11:30** *Motor Torque Optimization under Impulsive Loading Using Neural Network Assisted Impedance Control*, Mostafa Rahimi Dizaji, Mohammad Reza Haeri Yazdi, and Moteaal Asadi Shirzi (University of Tehran, Tehran, Iran)
- 11:30 - 11:50** *The Reconfigurable Spherical Robot with Telescopic Leg and Robotic Manipulator Arm*, K.R. Asfar (Jordan University of Science and Technology, Jordan)
- 11:50 - 12:10** *Thermoelectrically-complemented Photovoltaics in Rural Lebanon*, Rida Nuwayhid (Hariri Canadian University, Lebanon)
- 12:10 - 12:30** *Fuzzy Logic Control of Air Combat Maneuver*, B.M. Badawy, S.F. Rezeka, E.M. Attia, and T. Awad (Alexandria University, Egypt)

**12:30 PM - 1:30 PM** *Lunch Break* **University Restaurant**

**1:30 PM - 3:30 PM** *Track I - T2A: Fluid Dynamics II* **Issam Fares Hall**  
*Co-Chairs: Michel Hayek* (Notre Dame University-Louaize, Lebanon) & *Jian-Jun Shu* (Nanyang Technological University, Singapore)

- 1:30 - 1:50** *On Unsteady Viscous Flows*, Jian-Jun Shu (Nanyang Technological University, Singapore)
- 1:50 - 2:10** *Some Thoughts on Kelvin's Minimum Energy Theorem*, Tony Saad, Joseph Majdalani (University of Tennessee Space Institute, USA)
- 2:10 - 2:30** *Analysis of the Turbulent Flow Characteristics in a Ribbed Backward Facing Step with Inclined Impingement Cooling*, Khudheyer Mushatet (Thiqar University, Iraq)
- 2:30 - 2:50** *Integral Formulation of the Compressible Flow in a Planar Injection Driven Rocket Chamber*, Michel Akiki, Joseph Majdalani (University of Tennessee Space Institute, USA)
- 2:50 - 3:10** *Chitosan as Flow Improver in Pipelines Carrying Water in Turbulent Flow: An Experimental Approach*, Hayder A. Abdulbari, Rosli Bin Mohd Yunus, Zulkafli Bin Hassan, Norseri Binti Mohd Mustaffa, Nur Khadijah Binti Mohamad Najib (University Malaysia Pahang, Malaysia)
- 3:10 - 3:30** *Turbulent Heat Transfer in Fin and Tube Heat Exchangers*, Farid Eskandarinia, Mousa Farhadi, Korosh Sedighi, Nima Niksefat (Noshirvani Industrial of Technology, Iran)

**1:30 PM - 3:30 PM** *Track II - T2B: Systems & Modeling II* **Pierre Abu Khater Hall**  
*Co-Chairs: Mohammad Hajj* (Virginia Tech, USA) & *Mohammad Younis* (SUNY Binghamton, USA)

- 1:30 - 1:50** *Packing and Layout Optimization*, Georges Fadel (Clemson University, USA)

**1:50 - 2:10** *Study of the Effects of Diversity in Multi-Objective Optimization*, Vishrut Bhatt, Georges Fadel, Sundeep Samson (Clemson University, USA)

**2:10 - 2:30** *Electro Speed Bumps*, Souheil Matar, Nizar Al Aawar (Hariri Canadian University, Lebanon)

**2:30 - 2:50** *Numerical Investigation of Thermosyphon Heat Pipe Performance in a Solar Water Heater*, Morteza Karimi Demneh (Sama Technical and Vocational Training School- Islamic Azad University-Karaj Branch, Iran)

**2:50 - 3:10** *Theoretical and Case Study Analysis for Building Using Thermal Insulation and Its Effect on Environment*, Mohamed Aboelazm, Ahmed Elsafty (AASTMT, Egypt)

**3:30 PM - 11:00 PM**

***Social Event II***

**3:30 - 5:30** Break (Ride to and from the hotels according the shuttle bus schedule included in the conference bag)

**5:30 - 7:30** Sightseeing at Jeita Grotto

**7:30 - 10:30** Dinner at a local restaurant to be announced during the conference

**10:30** Ride to hotels





## Wednesday, June 15

8:00 AM - 9:00 AM *Registration* Conference Business Center

9:00 AM - 10:00 AM *Keynote Lecture III* Issam Fares Hall

Introduction by Nabil Chalhoub (Wayne State University, USA)

### *Transportation Fuels: Past, Present and Future*

**Prof. Naeim Henein**

Director of the Center for Automotive Research  
Mechanical Engineering Department  
Wayne State University

10:00 AM - 10:30 AM *Coffee Break* Conference Business Center

10:30 AM - 12:30 PM *Track I - W1A: Materials Sciences* Issam Fares Hall

*Co-Chairs: Fabio Casciati* (University of Pavia, Italy) & *Xin Wu* (Wayne State University, USA)

**10:30 - 10:50** *Aging of the Elastomeric Component in Base Isolators: An Experimental Study*, Fabio Casciati, Lucia Faravelli (University of Pavia, Italy)

**10:50 - 11:10** *Numerical Investigations on Melt-Through Prediction and Evaluation of Residual Stress of Super-Heat Steam Pipeline during In-Service Welding*, Farid Vakili-Tahami, Mohammad Zehsaz, Mohammad-Ali Saeimi-Sadigh, Amin Paykani (University of Tabriz, Iran)

**11:10 - 11:30** *A Shrinkage, Warpage and Anisotropy Analysis of a Thin Walled 3-D Injection Molded Component*, Badih Jawad, Steve J. Sobolak (Lawrence Technological University, USA)

**11:30 - 11:50** *Microstructure-Based Micromechanics Modeling on Tensile Behavior of Dual Phase Steels*, Xin Wu (Wayne State University, USA)

**11:50 - 12:10** *Effect of Heat Treatments on the Fatigue Performance of Carbon Steel*, D. Ramadan, O. Saied, Mohamed A. Gerbil (University of Garyounis, Libya)

**12:10 - 12:30** *Cooling of Hot Chip in Rectangular Channel Using Phase Change Materials as a Heat Sink*, Ahmad Ali Rabienataj Darzi, Mousa Farhadi, Kurosh Sedighi, Hamid Hassanzadeh Afrouzi, Mahmoud Jourabian (Babol University of Technology, Iran)

10:30 AM - 12:30 PM *Track II - W1B: Dynamics & Vibrations* Pierre Abu Khater Hall

*Co-Chairs: Badih Jawad* (Lawrence Technological University, USA) & *Seifedine Kadry* (American University of the Middle East, Kuwait)

**10:30 - 10:50** *Investigation into the Response of Slacked Carbon Nanotube Resonators to Electric Actuation*, Mohammad Younis (SUNY Binghamton, USA)

**10:50 - 11:10** *Modal Analysis of Howell-Bunger Valves Using FEM Method*, Farid Vakili-Tahami, Mohammad-Ali Saeimi-Sadigh, Mohammad Zehsaz, Amin Paykani (University of Tabriz, Iran)

**11:10 - 11:30** *Modeling and Nonlinear Analysis of Piezoelectric Energy Harvesting from Aeroelastic Vibrations*, A. Abdelkefi, A. H. Nayfeh, and M. R. Hajj (Virginia Tech, USA)

**11:30 - 11:50** *Uncovering Accelerometer Seismic Mass Using Reversed Engineering and Finite Element Simulation*, Mohd Firdaus Hassan, Nasrul Azuan Alang (University Malaysia Pahang, Malaysia)

**11:50 - 12:10** *Effect of Shape Memory Alloy (SMA) Wires on Natural Frequency of Plates*, Mohammad Barzegari, Mohammad Hadi Pashaei, Morteza Dardel, Ali Fathi (Babol Noshirvani University of Technology, Iran)

**12:30 PM - 2:00 PM** *Lunch Break* **University Restaurant**

**2:00 PM - 11:00 PM** *Conference Tour*

**2:00 - 10:30** Transport and sightseeing at Raouche Rocks, Beiteddine Palace & Beirut Central District (free time for shopping) including a dinner in a local restaurant to be announced during the conference.

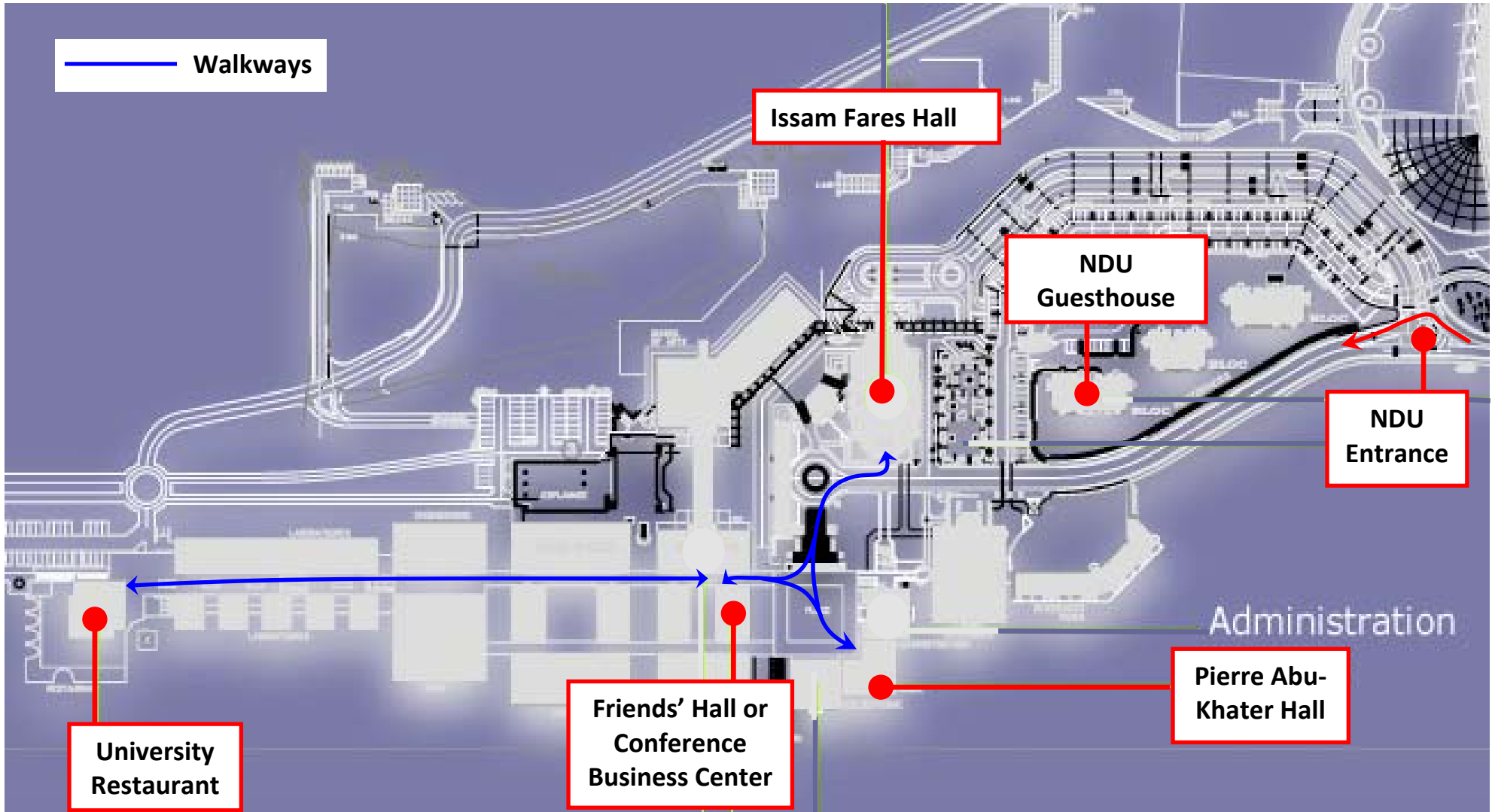
**10:30** Ride to hotels

## ICARAME'11: Social Program



- The social program I includes transport from the campus to the historic sites of Jbeil, a city believed to be one of the oldest continuously inhabited cities in the world. The break includes visits to the Old Souks and castles with some free time for fun. Thereafter all participants will gather in a local restaurant to taste the delicious local foods.
- All fees are included in the registration.
- The social program II includes transport from the campus to the cavernous natural site of Jeita Grotto, just selected in the final list competing for the new Seven Wonders of the World. After the visit, attendees will be transported to the mountainous area and will gather in a local restaurant to taste the local foods.
- All fees are included in the registration.
- The conference tour is a half-day activity including a visit to the natural site of the Raouche Rocks in Beirut, a long trip in the mountain to visit the Beiteddine Palace, and a trip back to Beirut to visit the renovated Beirut Central District. The tour includes a dinner in a local restaurant and some free time for shopping and sightseeing.
- All fees are included in the registration.
- Visits to the Stone Wing Museum and the Lebanese Emigration Research Center Museum at Notre Dame University - Louaize are available upon request for groups. Please inquire at the registration desk.

# NDU Campus Map



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