

The Supernetwork Sentinel

Summer 2013

Welcome to the Summer 2013 edition of ***The Supernetwork Sentinel***, the newsletter of the Virtual Center for Supernetworks at the Isenberg School of Management, UMass Amherst. ***The Supernetwork Sentinel*** is published in Fall, Winter, and Summer editions. The newsletter's purpose is to keep you informed of events, activities, and successes of the Virtual Center for Supernetworks, the Center Associates, and the Supernetworks Laboratory for Computation and Visualization. In this newsletter, we highlight a very special symposium, accolades received, and other accomplishments of the Center Associates as well as exciting conference presentations that we have given and other news. As always, we also include a list of our recent Center publications.

Anna Nagurney
 John F. Smith Memorial Professor
 Director – Virtual Center for Supernetworks
<http://supernet.isenberg.umass.edu>

Center Associates with Dr. Amir H. Masoumi after his receipt of his PhD



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AAAS Dynamics of Disasters Symposium in Boston a Big Success

The [2013 AAAS Annual Meeting in Boston](#), which took place February 14-18, 2013, is now over and it was an intellectual feast. The venue at the Hynes Center was perfect, given the frigid temps.

The photos below were taken at the AAAS meeting and at the symposium that Professor Anna Nagurney organized: [Dynamics of Disasters: Harnessing the Science of Networks to Save Lives](#), which took place on Sunday, February 17.



The symposium consisted of 3 panelists and 2 discussants with the former delivering 20 minute presentations, and the latter 10 minute ones. The perspective was multidisciplinary with engineering, operations research and management science, computing, applied mathematics, and even economics represented by the panelists and discussants (sometimes under one hat). We heard about radar placement and tornadoes, emergencies and snowstorms, evacuation networks under disruptions, material convergence and congestion post disasters, and the location of disasters world-wide.

The panelists:

Professor David McLaughlin, University of Massachusetts Amherst

[Chasing Storms Across Disciplines](#)

Professor Laura McLay, Virginia Commonwealth University

[The Emergency Medical and Fire Calls During Severe Weather Events](#)

Panos M. Pardalos, University of Florida

[Assessing the Vulnerability of Evacuation Plans via Critical Element Detection](#)

The discussants:

Professor Jose Holguin-Veras, Rensselaer

Polytechnic Institute, who focused on disasters that he had studied from the earthquake in Haiti to the triple disaster in Fukushima and Center Associate Professor Tina Wakolbinger, Vienna University of Economics and Business, who provided an excellent overview of the symposium with an emphasis on humanitarian logistics.

We had 1 or 2 questions after each presentation and then opened up the symposium to additional Q&A.



Professor Nagurney with (l-r) Professors McLaughlin, McLay, Pardalos, Aboufadel, Holguin-Veras, and Wakolbinger

Professor Nagurney thanks the outstanding panelists: Professor David McLaughlin, who is also the Director of CASA (Center for the Adaptive Sensing of the Atmosphere) at UMass Amherst, Professor Laura McLay of the Department of Statistical Sciences and Operations Research at Virginia Commonwealth University, who wrote [a blogpost on our symposium](#), Distinguished University Professor Panos M. Pardalos, who is an AAAS Fellow and an INFORMS Fellow, Professor Jose Holguin-Veras, William H. Hart Professor at RPI, and the Director of the Center for Infrastructure, Transportation, and the Environment, and Professor Tina Wakolbinger, Head of the Research Institute for Supply Chain Management, who traveled from the Vienna University of Economics and Business in Austria, for their scientific leadership on problems of great societal importance. Thanks also to Professor Ed Aboufadel and AMS for supporting our symposium.

Professor Anna Nagurney Contributes to Dream Course Engineered Systems at the University of Oklahoma

The invitation sent to Professor Anna Nagurney stated: *It is our pleasure to invite you to participate in the*

Presidential Dream Course titled "Understanding and Engineering Systems".

Dream Courses at the University of Oklahoma (OU) were initiated beginning in 2004 by President David L. Boren. The Dream Course program provides extra resources to enhance educational aspects of certain courses, in part for use to invite distinguished external speakers to campus. OU is particularly interested in courses that cover important topics for concerned and engaged citizens in the 21st century.

Recognizing the increasing importance of systems, our School has recently re-configured itself to become a School of Industrial and Systems Engineering. This lecture series will help us to focus attention on systems and systems engineering.

We expect attendees to include students and faculty from various colleges from the OU Norman and Tulsa campuses. We expect between 20 to 50 people to attend this lecture.

On behalf of the course coordinators it is my pleasure to invite you to be one of the key note speakers.

In addition, we invite you to offer a lecture to the public during your stay with us. We expect between 50 and 100 people to attend this lecture, including faculty, students, and the interested public, with backgrounds in engineering, economics, business, political science, humanities, and business. If time and travel constraints allow, these lectures are often accompanied by a reception and are covered by the daily university newspaper.

The invitation came from Professor J. K. Allen, who is also the Chair of the Dream Course Committee. She is an MIT grad and a UC Berkeley PhD and had previously been at Georgia Tech -- a great role model!

Professor Nagurney accepted the invitation and, on April 1, 2013, she delivered two lectures at the University of Oklahoma, one in the afternoon, and one in the evening, on supply chains and network vulnerability, respectively.



Scenes of the beautiful University of Oklahoma campus in Norman

She also had the opportunity to meet with the University of Oklahoma INFORMS Student Chapter, whose Faculty Advisor is Professor Kash Barker.



University of Oklahoma students and several faculty

She thanks her host, Professor Allen, and all the faculty and students who made her visit their so pleasant and rewarding.

Professor Anna Nagurney Speaks at The New York Times EnergyforTomorrow Conference



Professor Anna Nagurney was an invited panelist on *Transport and Traffic* at an extraordinary conference -- [The New York Times 2013 Energy for Tomorrow Conference](#), which took place April 25, 2013 in NYC. It was an intellectual feast that brought together mayors, an Academy Award winner, thought leaders, scientists, environmentalists, investors, policy makers, and decision-makers, corporate employees from IBM to Google, as well as a farmer/former NBA player/MacArthur Fellow -- and these were just some of the speakers. In the audience, she met a colleague from Cornell (now retired), a diplomat from the Chinese embassy in DC, a Georgia Tech professor, numerous journalists from as far as Singapore, affordable housing advocates, urban planners, students, a researcher at MIT, head of the electric vehicle

taxi program for NYC, and a financier in private equity, to single out just a few.



Professor Anna Nagurney with Professor Richard Schuler of Cornell University at the conference

The conference began with a stimulating breakfast session (the food was good, too) on smart vehicles. Even operations research was mentioned -- indeed, where would transport studies be without OR?!

Mayor Michael Bloomberg of NYC, who needs no introduction, was introduced by Arthur Sulzberger Jr., the publisher of *The New York Times*, and both were absolutely brilliant.

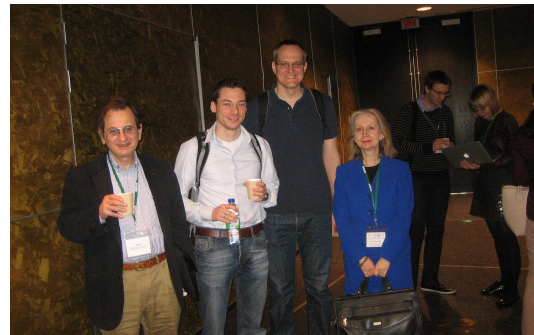


One of the panels at The New York Times conference

The conference was videostreamed and [you can access the videos of the various panels on the conference website](#). The *Transport and Traffic* panel that Professor Nagurney was part of [can be accessed directly here](#). She brought the Braess paradox into the conversation as well as congestion charging and transport congestion policies dating back to Roman times -- when chariots were the problem!

Center Associates Busy Presenting at Conferences

Since our last newsletter, we have presented at several conferences with many more presentations scheduled for the summer.



(l-r) Professors Rustem, Wolfram, Kuhn, and Nagurney at CMS Montreal

May 1-3, 2013, the Center Director took part in the 10th Computational Management Science Conference in Montreal, Canada. She delivered two presentations: **A Supply Chain Network Game Theoretic Framework for Time-Based Competition with Transportation Costs and Product Differentiation**, joint with Center Associate Professor Min Yu of the Pamplin School of Business at the University of Portland in Oregon and **A Cournot-Nash-Bertrand Game Theory Model of a Service-Oriented Internet with Price and Quality Competition Among Network Transport Providers**, joint with Professor Tilman Wolf of the College of Engineering at UMass Amherst.



Doctoral Student Center Associate Dong Li with Center Associate Professor Patrick Qiang at POMS Denver with Friends

Doctoral Student Center Associate Dong "Michelle" Li took part in the POMS Conference in Denver, Colorado, May 3-6, 2013. She presented two papers, both of which are joint with the Center Director and Center Associate Professor Ladimer S. Nagurney of the University of Hartford: **Pharmaceutical Supply Chain Networks with Outsourcing Under Price and**

Quality Competition, which has now been accepted for publication in the journal, *International Transactions in Operational Research*, and **Securing the Sustainability of Global Medical Nuclear Supply Chains Through Economics Cost Recovery, Risk Management, and Optimization**, which is forthcoming in the *International Journal of Sustainable Transportation*.

Center Associate Professor Patrick Qiang of Penn State Malvern presented the paper at POMS Denver entitled: **Financial Networks with Socially Responsible Investing**. This paper, which is joint with Center Associate Professor Ke Ke of the School of Business at Central Washington University, and Professor Yihong Hu, has now been published in the special issue of the journal *Computational Management Science* with the theme of *Financial Networks* edited by the Center Director. Congratulations on this very interesting paper!



Professor Nagurney with doctoral students at the Nordlog PhD Workshop

On June 3, 2013, Professor Anna Nagurney was a speaker at the Nordlog PhD Workshop, which took place at the School of Business, Economics and Law at the University of Gothenburg in Sweden, where she has been spending part of her sabbatical this year. She was one of three invited speakers at this workshop, which also consisted of reading doctoral students' papers and offering advice. The students came from the Nordic countries as well as from Germany.



Professor Nagurney with several NOFOMA conferees

Professor Nagurney's Nordlog lecture was on **Reflections of an Experienced Researcher on Presenting and Publishing Quantitative Research**.

This workshop was part of the NOFOMA Conference, which immediately followed and took place at the Chalmers University of Technology in Gothenburg. This was the 25th NOFOMA Conference, which focuses on logistics.

The Center Associates will be well represented at the [Euro INFORMS Conference in Rome, Italy](#). Center Associate Professor Patrizia Daniele has organized several sessions at this conference on variational inequalities and Center Associates Professor Tina Wakolbinger, Jose M. Cruz of the School of Business at the University of Connecticut, and Dmytro Matsypura of the School of Business at the University of Sydney in Australia, will be presenting their research.

In addition, Professor Tina Wakolbinger is the local organizing partner for the [18th International Symposium on Logistics with the theme Resilient Supply Chains in an Uncertain Environment](#), which will take place in Vienna, Austria, July 7-10, 2013.

On June 14, 2013, the Center Director delivered the plenary talk, *Network Economics and the Internet*, at the Network Models in Economics and Finance Conference in Athens, Greece.



Professor Nagurney with Professor Panos M. Pardalos (in blue) and other conferees in Athens

The conference banquet took place at the new Acropolis Museum with views of the Parthenon and the Acropolis. Professor Nagurney also thanks the organizers of the conference, Professors Pardalos, Kalyagin, and Rassias.

While in Athens, she also had a chance to see Center Associate Dr. Stavros Siokos who was in Athens for a family event.

Kudos and News



On February, 19, 2013, we, along with the UMass Amherst INFORMS Student Chapter, had the pleasure of hosting Center Associate Professor Tina Wakolbinger who delivered an excellent presentation at the Isenberg School of Management.

Professor Wakolbinger then returned the hospitality when Professor Anna Nagurney was a Guest Professor at the Vienna University of Economics and Business in mid March 2013. She enjoyed Vienna very much and also thanks Professor Manfred Fischer and Dr. Stauffer-Steinnocher for their attention to detail and logistics of her visit.

While there, Nagurney taught an intensive course on [Humanitarian Logistics and Healthcare](#) and also delivered a seminar on [Perishable Product Supply Chains in Healthcare: Models, Analysis and Computations](#).

On April 16, 2013, Center Associate Professor Patrick Qiang was the host for Professor Anna Nagurney's visit to his campus at Penn State Malvern where she delivered the seminar: *Networks Against Time: from Food to Pharma*. Professor Nagurney very much enjoyed the questions from the audience and the discussions that followed. Audience members came not only from Pennsylvania but also from New Jersey and from Delaware.



Professors Anna Nagurney and Patrick Qiang

Congratulations to Amir H. Masoumi who successfully defended his dissertation, **Supply Chain Management of Perishable Products with Application to Healthcare** on February 1, 2013, and received his PhD with a concentration in Management Science from UMass Amherst on May 10, 2013. Dr. Masoumi will be an Assistant Professor in the School of Business at Manhattan College, starting in the Fall.



Amir (in purple) with his dissertation committee members (l-r) Professors Senay Solak, Hari Balasubramanian, and Anna Nagurney, after his dissertation defense

On April 19, 2013, Amir H. Masoumi, along with Professor Anna Nagurney and Professors Ana Muriel and Hari Balasubramanian of the Department of Mechanical and Industrial Engineering at UMass Amherst and Professor Senay Solak of the Isenberg School of Management, took part in a panel at the College of Engineering at UMass Amherst on [The Process of Applying for and Securing an Academic Position](#). This event was organized by the UMass Amherst INFORMS Student Chapter, whose Faculty Advisor is the Center Director.



The Panelists at the UMass Amherst Student Chapter event

Center Associate Professor Ladimer S. Nagurney of the College of Engineering, Technology, and Architecture at the University of Hartford, was promoted to Full Professor of Electrical, Computer, and Biomedical Engineering.

Center Associate Professor Jose M. Cruz of the Department of Operations and Information Management at the School of Business at the University of Connecticut received the Undergraduate Teaching Award. He had previously received the Graduate Teaching Award. Congratulations! He is the Director of the very successful Master's degree program there in Business Analytics and Project Management.

Congratulations to Center Associate Professor Qiang "Patrick" Qiang of Penn State Malvern. He received a 2 year grant from the China National Science Foundation for his project:

Competition, Efficiency and Coordination Mechanism of Express Service Providers of Online Shopping Supply Networks. This project utilizes the concepts and knowledge from management science, game theory, and transportation research to analyze the industrial ecology of the e-commerce market in China. The goal of the project is to maximize the efficiency of the express service provider so that the social welfare of the whole e-commerce supply chain will be optimized. They expect the results from this project will provide guidance to improving the service quality and to maximizing the investment effectiveness.

Congratulations to Center Associates Professors Patrick Qiang, Ke Ke, Trisha Anderson of Texas

Wesleyan University, and June Dong of the School of Business at SUNY Oswego. Their paper, **The Closed-Loop Supply Chain Network with Competition, Distribution Channel Investments, and Uncertainties**, appears in *Omega* (2013), **41(2)**, 186-194.

Congratulations to Center Associate Dr. Stavros Siokos, who is the President of the *Sciens* Fund of Hedge Funds Management in London, UK. His paper, [Fund of Hedge Fund Portfolio Construction Process in the New Era of Risk](#), Alex Allen, Jérôme Huillard, and Stavros Siokos, appears in the *International Journal of Portfolio Analysis and Management*.

Congratulations to Center Associate Professor Tina Wakolbinger, whose paper, with Professors Fuminori Toyasaki and Bill Kettinger, **The Value of Information Systems for Product Recovery Management**, appeared in the *International Journal of Production Research*, **51(4)**, 1214-1235.

Congratulations to Center Associate Professor Lan Zhao of SUNY Old Westbury. Her paper, **A Hybrid Mechanism for Heterogeneous E-procurement Involving a Combinatorial Auction and Bargaining**, joint with Professors H. Huang, R.J. Kauffman, and H. Xu, appears in *Electronic Commerce Research and Applications* (2013), **12(3)**, 181-194.

Professor Anna Nagurney guest edited a double volume of the journal [Computational Management Science](#) on the theme [Financial Networks](#), consisting of 8 papers. In addition to her editorial, the paper, **Financial Networks with Socially Responsible Investing**, by Center Associates Professors Patrick Qiang and Ke Ke of Central Washington University with Yihong He appears in the volume as well as the paper, **The Co-Evolution of Integrated Corporate Financial Networks and Supply Chain Networks with Insolvency Risk**, by Center Associate Professor Zugang "Leo" Liu of Penn State Hazleton.

Center Associate Professor Ding Zhang of the School of Business at SUNY Oswego is in Nanjing, China, working as a Visiting Professor on a short term research appointment at Nanjing University of Science and Technology.

Congratulations to Doctoral Student Center Associate Dong "Michelle" Li, who has had several papers accepted for publication in the past few months: **A Dynamic Network Oligopoly Model with Transportation Costs, Product Differentiation, and Quality Competition**, A. Nagurney and D. Li, *Computational Economics* (2013), in press, and **Pharmaceutical Supply Chain Networks with Outsourcing Under Price and Quality Competition**, A. Nagurney, D. Li, and L.S.

Nagurney, *International Transactions in Operational Research* (2013), in press.

In addition, Doctoral Student Center Associate Sara Saberi has also had a paper accepted for publication on research that is being supported by the NSF grant awarded to Professors Tilman Wolf and Anna Nagurney. The paper is: **A Network Economic Game Theory Model of a Service-Oriented Internet with Choices and Quality Competition**, A. Nagurney, D. Li, T. Wolf, and S. Saberi, *Netnomics* (2013), in press.



Professor Anna Nagurney with her host at the University of Gothenburg, Professor Jonas Floden, celebrating the publication of their books in Gothenburg, Sweden, on March 7, 2013. Professor Nagurney's book, *Networks Against Time: Supply Chain Analytics for Perishable Products*, joint with Center Associates Professors Min Yu, Amir H. Masoumi, and Ladimer S. Nagurney, was published by Springer Business + Science Media, NYC, in 2013.

Recent Center Publications

Please see our center articles at:
<http://supernet.isenberg.umass.edu/dart.html>

A Dynamic Network Oligopoly Model with Transportation Costs, Product Differentiation, and Quality Competition, A. Nagurney and D. Li, *Computational Economics* (2013), in press.

Pharmaceutical Supply Chain Networks with Outsourcing Under Price and Quality Competition, A. Nagurney, D. Li, and L.S. Nagurney, *International Transactions in Operational Research* (2013), in press.

Design of Sustainable Supply Chains for Sustainable Cities, A. Nagurney, *Environment & Planning B* (2013), in press.

A Network Economic Game Theory Model of a Service-Oriented Internet with Choices and Quality Competition, A. Nagurney, D. Li,

T. Wolf, and S. Saberi, *Netnomics* (2013), in press.

Supply Chains and Transportation Networks, A. Nagurney, *Handbook of Regional Science* (2013), M. Fischer and P. Nijkamp, Editors, Springer, Berlin, Germany, in press.

Securing the Sustainability of Global Medical Nuclear Supply Chains Through Economic Cost Recovery, Risk Management, and Optimization, A. Nagurney, L. S. Nagurney, and D. Li (2012), to appear in the *International Journal of Sustainable Transportation*.

Financial Networks, A. Nagurney, *Computational Management Science* (2013), **10(2-3)**, 77-80.

Competitive Food Supply Chain Networks with Application to Fresh Produce, M. Yu and A. Nagurney, *European Journal of Operational Research* (2013), **224(2)**, 273-282.

Medical Nuclear Supply Chain Design: A Tractable Network Model and Computational Approach, A. Nagurney and L. S. Nagurney, *International Journal of Production Economics* (2012), **140(2)**, 865-874.

Supply Chain Networks with Global Outsourcing and Quick-Response Production Under Demand and Cost Uncertainty, Z. Liu and A. Nagurney, *Annals of Operations Research*, in press.

The Closed-loop Supply Chain Network with Competition, Distribution Channel Investment, and Uncertainties, Q. Qiang, K. Ke, T. Anderson, and J. Dong, *Omega* (2012), **41(2)**, 186-194.

Choice as a Principle in Network Architecture, T. Wolf, J. Griffioen, K. Calvert, R. Dutta, G. Rouskas, I. Baldine, and A. Nagurney, in the *Proceedings of ACM SIGCOMM 2012*, Helsinki, Finland, August 13-17, 2012.

Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium Reformulation, Z. Liu and A. Nagurney, *Optimization and Engineering* (2012), **13(2)**, 471-503.

A Bi-Criteria Measure to Assess Supply Chain Network Performance for Critical Needs Under Capacity and Demand Disruptions, Q. Qiang and A. Nagurney, *Transportation Research A* (2012), Special issue on Network Vulnerability in Large-Scale Transport Networks, **46(5)**, 801-812.

A Supply Chain Generalized Network Oligopoly Model for Pharmaceuticals Under Brand Differentiation and Perishability, A. H. Masoumi, M. Yu, and A. Nagurney
Transportation Research E (2012), **48**, 762-780.

An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty, A. Nagurney, A.H. Masoumi, and M. Yu (2013).

A Supply Chain Network Game Theoretic Framework for Time-Based Competition with Transportation Costs and Product Differentiation, A. Nagurney and M. Yu (2013).



Professor Anna Nagurney with Doctoral Student Center Associates

The Center Director and the Center Associates thank you for your support!

We wish everyone a wonderful summer!

The Center Director

Dr. Anna Nagurney
John F. Smith Memorial Professor

Center Associates

Dr. Trisha Anderson
Dr. Jose M. Cruz
Dr. Patrizia Daniele
Dr. June Dong
Dr. Ke "Grace" Ke
Dr. Zugang "Leo" Liu
Dr. Amir H. Masoumi
Dr. Dmytro Matsypura
Dr. Ladimer S. Nagurney
Dr. Qiang "Patrick" Qiang
Dr. Padma Ramanujam
Dr. Stavros Siokos
Dr. Tina Wakolbinger
Dr. Min Yu
Dr. Ding Zhang
Dr. Lan Zhao

Doctoral Students

Dong "Michelle" Li
Sara Saberi
Shivani Shukla

Center Website:

<http://supernet.isenberg.umass.edu>

If you would like to be put on our email list, contact: supernet@isenberg.umass.edu