

# The Supernetwork Sentinel

## Winter 2012

Welcome to the Winter 2012 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 the notable activities and accomplishments of the Center Associates. As always, we include a list of our recent Center publications.

Anna Nagurney  
John F. Smith Memorial Professor  
Director – Virtual Center for Supernetworks  
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**Center Director Professor Anna Nagurney with Professor Chandra Bhat of the University of Texas Austin at the Regional Science Conference in Miami, Florida in November 2011**



**Several Center Associates with Some Friends at the INFORMS Annual Meeting in Charlotte, NC in November 2011**

**Names of all Center Associates can be found on the last page of this newsletter.**

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## Center Associates Shine at Conferences and Other Venues

The Center Associates had a very busy Fall 2011 semester. In addition to the courses that they taught at various universities on three different continents, they also spoke at a variety of conferences and venues.



**Professors Nagurney and Altman at the NetGCoop Conference in Paris**

Professor Anna Nagurney was a keynote speaker at [NetGCoop 2011](#), the International Conference on Network Games, Control, and Optimization, which took place in Paris, France, October 12-14. The title of her keynote was **Grand Challenges and Opportunities in Supply Chain Network Analysis to Design**. She thanks her hosts, Drs. Baser, Altman, and Chahed, for their wonderful hospitality.



**The venue (Mount Rushmore) for the FIE 2011 reception**

Center Associate Professor Ladimer S. Nagurney of the University of Hartford presented the paper, **Synergies and Opportunities Between Engineering and Law**, in a session titled: **Professional Skills Beyond Teamwork and Communication**, at the 2011 Frontiers in Education (FIE) Conference, held October 13-15 in Rapid City, South Dakota.

On October 28, 2011, the Center Director delivered a Management Science Research Seminar, entitled: **Perishable Product Supply Chains in Health Care: Models, Analysis, and Computations**, at the Desautels School of Management at McGill University in Montreal, Canada. Her wonderful host was Professor Vedat Verter.

The major annual conference at which Center Associates have been convening annually is the [INFORMS Annual Conference](#), which this year took place in Charlotte, North Carolina, November 13-16, 2011.



**Several of the Center Associates post the Dr. Cruz session with a co-author**

Center Associate Professor Jose M. Cruz of the University of Connecticut organized a session for this conference, [Sustainable and Responsible Supply Chain Management](#), in which he spoke, along with several other Center Associates. The session was part of the Manufacturing & Service Operations Management / Sustainable Operations Cluster. In particular, Doctoral Student Center Associate Min Yu presented the paper, **Sustainable Fashion Supply Chain Management Under Oligopolistic Competition and Brand Differentiation**, co-authored with the Center Director, and Center Associate Professor Zugang "Leo" Liu of Penn State Hazleton presented the paper, **Supply Chains Competition Through Corporate Social Responsibility (CSR)**. Center Associate Professor Tina Wakolbinger of the Vienna University of Economics and Business traveled from Austria to speak on **Green Information Systems for Product Recovery Management**, co-authored with Professor Kettinger of the University of Memphis and Professor Toyasaki of York University in Canada.

In another session, also in the same cluster, Center Associate Professor Patrick Qiang of Penn State Malvern presented his latest research, joint with Center Associates Professors Ke Ke of Central Washington University, Trisha Anderson of Texas Wesleyan University, and June Dong of SUNY Oswego, on closed loop supply chains



(see Kudos and News below for more information).

Center Associate Professor Zugang "Leo" Liu of Penn State Hazleton also presented at this conference a paper with Professor Anna Nagurney on their latest work on global supply chain outsourcing (see Kudos and News below).

Center Associate Professor Dmytro Matsypura, who is at the University of Sydney, traveled from Australia to present his [latest research on financial networks](#).



**The Leaders panel at INFORMS in Charlotte**

In addition, Center Director Professor Anna Nagurney spoke on two panels: [Becoming an O.R./Analytics Newsmaker](#), and [Leaders Give Professional Advice to Women and Men](#).

**Professor Anna Nagurney with Professor**



**David E. Boyce at the RSAI conference in Miami**

Prior to the INFORMS Conference, she took part in the [58<sup>th</sup> Annual North American Meetings of the Regional Science Association International \(RSAI\)](#) at which she delivered two papers co-authored with Center Associate Professor Ladimer S. Nagurney on the dynamics of predator-prey networks and on medical nuclear

supply chain design. She serves as a [Councillor-at-Large of NARSC](#).

Center Associate Professor Ladimer S. Nagurney gave the presentation, **A Network Model and Computational Approach for the Molybdenum Supply Chain for Nuclear Medicine**, based on joint work with the Center Director, at the Fall 2011 Joint Meeting of the New England Sections of the American Physical Society, the American Association of Physics Teachers, and the Society of Physics Students, Amherst, MA, November 19, 2011.

Many of the presentations given by Center Associates can be found on the Center site at: <http://supernet.isenberg.umass.edu/visuals.html>

## **The UMass Amherst INFORMS Student Chapter Garners its 5<sup>th</sup> National Award**



**Several chapter officers with Nagurney – Amir H. Masoumi is holding the award plaque**

For the 5<sup>th</sup> year in a row, the UMass Amherst INFORMS Student Chapter was recognized at the Annual INFORMS (Institute for Operations Research and the Management Sciences) Meeting, which took place November 13-16, 2011, in Charlotte, North Carolina.

Several of the chapter officers joined the Center Director, who serves as the Faculty Advisor of this student chapter, at the awards breakfast.

This year's President of the student chapter is Doctoral Student Center Associate Michelle "Dong" Li.

This past semester the chapter hosted another "Meet the Executive" event. On November 18, 2011, Mr. Dan Viederman, the CEO of Verite', which is a non-profit organization, delivered the presentation, **Sweatshops and Slavery in the 21<sup>st</sup> Century: What Business Can Do**. His talk generated a lot of lively discussions surrounding

global supply chains and corporate social responsibility.



**Mr. Viederman with gift bag with some of the members of the audience at his talk**

For chapter activities and photos, please visit the chapter website at:

<http://student.som.umass.edu/informs/>

## **Center Director Authors Invited Commentary for Resources for the Future**

The Center Director delivered a plenary talk, **Sustainability: Methodology and Applications**, at the SAMS Engineering and Renewable Energy Opening Workshop, which took place, September 19-21, 2011, in Research Triangle Park, North Carolina.

While at SAMS, she had an opportunity to visit with Center Associate Dr. Padma Ramanujam, who works at SAS, and to also meet with Dr. Radhika Kulkarni, a VP of SAS.

Subsequently, Professor Anna Nagurney was invited by Mr. Joshua Linn, who attended the workshop, to write a commentary for Resources for the Future (RFF). Her commentary, **Designing Transportation Infrastructure to Include the Human Element**, was published on the RFF website on November 18, 2011 and may be accessed at:

<http://supernet.isenberg.umass.edu/commentary/RFF-PolicyCommentary-118111.html>

The commentary cites the translation of the original Braess (1968) paradox paper that was done by Professor Dietrich Braess, Center Associate Professor Tina Wakolbinger, and Anna Nagurney and was published in the journal *Transportation Science* in 2005.



**Professor Anna Nagurney with Dr. Padma Ramanujam at SAS in North Carolina**

## **Kudos and News**

Center Associate Professor Tina Wakolbinger of the Vienna University of Economics and Business has two new positions, in addition to her Full Professorship of Supply Chain Service and Networks. She is now the Head of the Research Institute for Supply Chain Management and also became the Deputy Head of the Institute for Transport and Logistics Management there.

Her paper, **Impacts of Private Earmarked Donations for Disaster Fundraising**, with Professor Fuminori Toyasaki of York University, is now in press in the *Annals of Operations Research*.

We congratulate Dr. Wakolbinger on her professional success!

Center Associates Professors Patrick Qiang, Ke Ke, Trisha Anderson, and June Dong have had their paper, **The Closed-loop Supply Chain Network with Competition, Distribution Channel Investment, and Uncertainties**, accepted for publication in *Omega*.

Also, kudos to Professor Patrick Qiang for his paper, **Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age**, with the Center Director, which appears in a special double volume issue of the *International Transactions in Operational Research* (2012), **19**, 123-160.

Congratulations to Center Associate Professor Zugang "Leo" Liu, who has had notable successes in publishing. His paper, **Risk Reduction and Cost Synergy in Mergers and Acquisitions via Supply Chain Network Integration**, with Anna Nagurney, appeared in the *Journal of Financial Decision Making* (2011), **7(2)**, 1-18. His paper, **Supply Chain Networks with Global Outsourcing and Quick-Response Production Under Demand and**



**Cost Uncertainty** (2011), is in press in the *Annals of Operations Research* and his paper, **Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium Reformulation** (2010), is in press in *Optimization and Engineering*. The latter two papers are also written with the Center Director.

In addition, Dr. Liu co-authored a paper with Center Associate Professor Jose M. Cruz, **Modeling and Analysis of the Multiperiod Effects of Social Relationship on Supply Chain Networks**, which was published in the *European Journal of Operational Research* (2011), **214**, 39-52.

Doctoral Student Center Associate Min Yu took part in the Future Academician Colloquium at the 2011 INFORMS Annual Meeting, in Charlotte, North Carolina. She also took part in the DSI Doctoral Colloquium, in Boston, also in November. Her paper, co-authored with Professor Anna Nagurney, **Sustainable Fashion Supply Chain Management Under Oligopolistic Competition and Brand Differentiation**, is the lead article in the Special issue on Green Manufacturing and Distribution in the Fashion and Apparel Industries of the *International Journal of Production Economics* (2012), **135**, 532-540.

In addition, Min with Doctoral Student Center Associate Amir H. Masoumi, and Anna Nagurney, has revised and resubmitted their paper, **A Supply Chain Generalized Network Oligopoly Model for Pharmaceuticals Under Brand Differentiation and Perishability**.



(l-r) Professors Nagurney, Solak, and Balasubramanian with Amir Masoumi after his defense

Congratulations also to Amir H. Masoumi, for successfully defending his doctoral dissertation proposal, **Supply Chain Management of Perishable Products with Application to Healthcare**, on December 12, 2011. His paper, co-authored with the Center Director, **Supply Chain Network Design of a Sustainable**

**Blood Banking System**, is in press in *Sustainable Supply Chains: Models, Methods and Public Policy Implications*, T. Boone, V. Jayaraman, and R. Ganeshan, Editors, Springer, London, England, 2012.

Center Associate Professor Ding Zhang of SUNY Oswego continues to be engaged in research on urban transportation and competitive supply chains with scholars in China, where he recently spent his sabbatical. He has worked on collaborative research projects with Halbin University of Science and Technology (HUST), the Nanjing University of Science and Technology (NUST), and Shanghai University. In addition, this year, Professor Zhang is working with Dr. Shusheng, who is a Visiting Scholar at SUNY Oswego from the Wuhan University of Science and Technology in China. Together they are researching theories and methods of regional logistical management.

Center Associate Dr. Stavros Siokos, is President of **Science Capital Management** and is responsible for the general management of Sciens in its capacity as investment advisor and asset manager for the fund of funds and the managed account platforms. Sciens Fund of Funds Management is part of Sciens Capital Management, which manages assets in private equity, venture capital, aviation, real estate, structured finance and fund of hedge funds. Sciens' investors include financial institutions, pension funds, private banks, foundations, endowments, family offices and high net worth individuals.

The Center Director has been selected as a 2012 Visiting Professor of Operations Management at the School of Business, Economics and Law at the University of Gothenburg in Sweden. She will be spending part of her sabbatical in 2012-2013 at this university. While at Gothenburg University, she will be working with faculty there, in particular, those in the Logistics and Transport group, the Environmental Economics group, and the Centre for Finance.

Center Associate Professor Patrizia Daniele of the University of Catania in Italy is organizing a session on **Variational Analysis** for the upcoming International Symposium on Mathematical Programming that will take place next August in Berlin, Germany.

Congratulations to Professor Daniele on the acceptance of her paper, with Professors A. Barbagallo and A. Maugeri, **Variational Formulation for a General Dynamic Financial Problem: Balance Law and Liability Formula**, which is in press in the journal, *Nonlinear Analysis: Theory, Methods & Applications*.

Center Associates will be represented at the upcoming the SBP, CMS, and POMS conferences that will take place, respectively, at the University of Maryland, Imperial College in London, England, and in Chicago, Illinois.



**Welcome luncheon for Visiting Doctoral Student Student Feixiong Liao**

For two months in the Fall, Mr. Feixiong Liao, who is a doctoral student at the Eindhoven University of Technology in The Netherlands, visited the Supernetworks Center and Lab. He is working on a dissertation on supernetworks under the supervision of Professor Harry Timmermans. The Center Director congratulates Mr. Liao on his receipt of the Outstanding Student Paper Award at the recent Transport Dynamics conference that took place in Hong Kong in December 2011.

## Recent Center Publications

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

**Sustainable Fashion Supply Chain Management Under Oligopolistic Competition and Brand Differentiation**, A. Nagurney and M. Yu, *International Journal of Production Economics*, Special issue on Green Manufacturing and Distribution in the Fashion and Apparel Industries (2012), **135**, 532-540.

**Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age**, A. Nagurney and Q. Qiang, *International Transactions in Operational Research* (2012), **19**, 123-160.

**Dynamics and Equilibria of Ecological Predator-Prey Networks as Nature's Supply Chains**, A. Nagurney and L. S. Nagurney *Transportation Research E* (2012), **48**, 89-99.

**Risk Reduction and Cost Synergy in Mergers and Acquisitions via Supply Chain Network Integration**, Z. Liu and A. Nagurney

*Journal of Financial Decision Making* (2011), **7(2)**, 1-18.

**Supernetworks: The Science of Complexity**, A. Nagurney, *Journal of University of Shanghai for Science and Technology* (2011), **33**, 205-228.

**Spatial Price Equilibrium and Food Webs: The Economics of Predator-Prey Networks**, A. Nagurney and L. S. Nagurney, in the *Proceedings of the 2011 IEEE Conference on Supernetworks and System Management*, F. Y. Xu and J. Dong, Editors, IEEE Press, Beijing China, pp 1-6.

**Supply Chain Network Design for Critical Needs with Outsourcing**, A. Nagurney, M. Yu, and Q. Qiang, *Papers in Regional Science* (2011), **90**, 123-142.

**Supply Chain Outsourcing Under Exchange Rate Risk and Competition**, Z. Liu and A. Nagurney, *Omega* (2011), **39**, 539-549.

**Fashion Supply Chain Management Through Cost and Time Minimization from a Network Perspective**, A. Nagurney and M. Yu (2011), in *Fashion Supply Chain Management: Industry and Business Analysis* (2011), T.-M. Choi, Editor, IGI Global, Hershey, Pennsylvania, pp 1-20.

**Modeling and Analysis of the Multiperiod Effects of Social Relationship on Supply Chain Networks**, J. M. Cruz and Z. Liu, *European Journal of Operational Research* (2011), **214**, 39-52.

**Supply Chain Network Design for Critical Needs with Outsourcing**, A. Nagurney, M. Yu, and Q. Qiang, *Papers in Regional Science* (2011), **90**, 123-142.

**The Closed-loop Supply Chain Network with Competition, Distribution Channel Investment, and Uncertainties**, Q. Qiang, K. Ke, T. Anderson, and J. Dong (2011), to appear in *Omega*.

**Supply Chain Network Operations Management of a Blood Banking System with Cost and Risk Minimization**, A. Nagurney, A. Masoumi, and M. Yu (2010), *Computational Management Science*, in press.

**Supply Chain Networks with Global Outsourcing and Quick-Response Production Under Demand and Cost Uncertainty**, Z. Liu and A. Nagurney (2011), *Annals of Operations Research*, in press.

**Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium**



**Reformulation**, Z. Liu and A. Nagurney (2010), *Optimization and Engineering*, in press.

**A Bi-Criteria Measure to Assess Supply Chain Network Performance for Critical Needs Under Capacity and Demand Disruptions**, Q. Qiang and A. Nagurney (2010), to appear in *Transportation Research A*, Special issue on Network Vulnerability in Large-Scale Transport Networks.

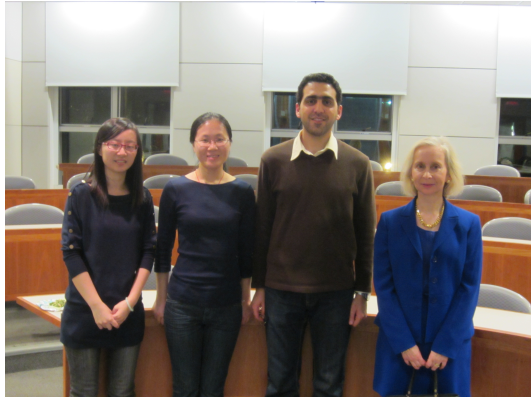
**A Supply Chain Generalized Network Oligopoly Model for Pharmaceuticals Under Brand Differentiation and Perishability**, A. H. Masoumi, M. Yu, and A. Nagurney (2011), revised and resubmitted.

**Multiproduct Humanitarian Healthcare Supply Chains: A Network Modeling and Computational Approach**, A. Nagurney, M. Yu, and Q. Qiang (2011), submitted.

**Medical Nuclear Supply Chain Design: A Tractable Network Model and Computational Approach**, A. Nagurney and L. S. Nagurney (2011), submitted.

**Design of Sustainable Supply Chains for Sustainable Cities**, A. Nagurney (2011).

**Supply Chains and Transportation Networks**, prepared for the *Handbook of Regional Science* (2011).



(l-r) Doctoral Student Center Associates Dong "Michelle" Li, Min Yu, and Amir H. Masoumi, with Professor Anna Nagurney after the UMass Amherst INFORMS Student Chapter party on December 9, 2011

**The Center Director and the Center Associates thank you for your support! Happy New 2012 Year!**

#### Center Director

Dr. Anna Nagurney  
John F. Smith Memorial Professor

#### Center Associates

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

#### Doctoral Students

Dong "Michelle" Li  
Amir H. Masoumi  
Min Yu

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