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# The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Winter 2011



Welcome to the Winter 2011 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 our recent conference presentations and other professional activities. We also share news about awards and accolades received by the Center Associates, their activities, and noteworthy upcoming events. As always, we include a list of our recent Center publications.

Anna Nagurney  
John F. Smith Memorial Professor  
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**Students Accompanying Professor Anna Nagurney to Boston**



**Networking at the INFORMS National Meeting in Austin, Texas**

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**(l-r) Drs. Qiang and Liu, Dr. Keskin and Min Yu, Drs. Nagurney and Fowler with the Magna Cum Laude Award**

## **UMass Amherst INFORMS Student Chapter Receives National Award**

On November 9, 2010, the [UMass Amherst INFORMS Student Chapter](#) received the Magna Cum Laude Award at the INFORMS National Conference in Austin, Texas.

Joining Professor Anna Nagurney at the awards breakfast were: Student Center Associate Min Yu, a doctoral student at the Isenberg School of Management, who served as last year's Chapter President, and two former Chapter Presidents, Drs. Patrick Qiang and Zugang "Leo" Liu, who are now faculty members at Pennsylvania State University campuses. Both are Center Associates.

The above photos were taken at the awards breakfast. We were presented with the award by Dr. Burcu Keskin of the University of Alabama and Dr. John Fowler of Arizona State University.

It was a terrific event and marked the fourth consecutive year that this chapter has been recognized with a national award!

## **Center Associates Present Their Research at the INFORMS National Meeting in Austin, Texas**

Eight of the [Supernetwork Center Associates](#) presented papers at the [INFORMS Annual Meeting in Austin, Texas](#), November 7-10, 2010.

Center Associate Dr. Tina Wakolbinger of the University of Memphis chaired the session: *Decision-Making in Nonprofit Organizations* in

which she presented a co-authored paper, "Collaborative Information Sharing in Humanitarian Supply Chains." In that session, Min Yu presented the paper, co-authored with Dr. Patrick Qiang of Pennsylvania State University Malvern and Dr. Anna Nagurney, entitled, "Supply Chain Network Design for Critical Needs with Outsourcing." This paper is now in press in *Papers in Regional Science*.

Center Associate Dr. Jose Cruz of the University of Connecticut chaired the session: *Sustainable and Responsible Supply Chain Management* in which he delivered the paper, "Mitigating Global Supply Chain Risks through Corporate Social Responsibility." In the same session, Center Associate Dr. Zugang Liu of Pennsylvania State University at Hazleton spoke on, "Consumer Environmental Awareness and Competition in Two-Stage Supply Chains," co-authored with Dr. Cruz and Center Associate Dr. Trisha Woolley (now Anderson).

Dr. Woolley Anderson presented the paper, co-authored with Dr. Anna Nagurney, entitled: "Environmental and Cost Synergy in Supply Chain Network Integration in Mergers and Acquisitions." This paper was published in *Sustainable Energy and Transportation Systems, Proceedings of the 19th International Conference on Multiple Criteria Decision Making, Lecture Notes in Economics and Mathematical Systems*, M. Ehrgott, B. Naujoks, T. Stewart, and J. Wallenius, Editors, Springer, Berlin, Germany (2010) pp 51-78.

Dr. Anna Nagurney presented, "Supply Chain Network Design under Profit Maximization and Oligopolistic Competition," in a session on *Risk Management* organized by Dr. Jussi Keppo and Dr. Jie Ning of the University of Michigan. This paper was published recently in the journal *Transportation Research E*.



**(l-r) Drs. Cruz, Woolley Anderson, Matsypura, Nagurney, Qiang, with Min Yu, and Dr. Liu in Austin, Texas**



**Dr. Tina Wakolbinger Chairing Her Session**

Dr. Patrick Qiang presented the paper, "A Bi-criteria Measure to Assess Supply Chain Network Performance for Critical Needs," in the session on *Disruptive Event Management*, which was co-authored with Dr. Anna Nagurney.

Center Associate Dr. Dmytro Matsypura traveled all the way from Sydney, Australia, where he holds the position of tenured lecturer at the University of Sydney to present the co-authored paper, "Margining Option Portfolios by Offsets with Two, Three, and Four Legs" in a *Financial Engineering* session.

In addition, Center Associate Dr. Padma Ramanujam of SAS Inc. joined us at INFORMS in Austin, Texas.

Many of the above presentations are posted on the [Visuals Page of the Supernetworks Center website](#).



**Dr. Anna Nagurney with Dr. Padma Ramanujam and Min Yu in Austin**

## Professor Anna Nagurney Speaks on Supply Chains at the Boston INFORMS Chapter Meeting

On November 23, 2010, Professor Anna Nagurney gave an invited talk at the Boston INFORMS Chapter Meeting. Her host was Dr. Les Servi of the MITRE Corporation.



**Professor Nagurney Giving Her Talk on Supply Chains**

Her presentation was entitled: "Supply Chain Networks: Challenges and Opportunities from Analysis to Design," and [it may be downloaded \(in pdf format\) here](#). The presentation gave an overview of some of the exciting supply chain projects that we have been involved in with applications ranging from electric power supply chains in New England to healthcare supply chains for critical needs products, from vaccines to medicines, as well as blood supply chains.

Accompanying Nagurney on this road trip were several doctoral students and an undergraduate student in Operations Management.



**Students at the INFORMS Boston Meeting (l-r) Min Yu, Dong Li, Amir Masoumi, Nathan Kollette, and Michael Marcellin**



It was a great experience to mingle with the audience, which included practitioners from many different industries in the Boston area, including employees of Oracle, BAE Systems, MITRE, and Fidelity Investments.

## Organizing Exciting Conferences in the US and China

The Center Director is serving on the Program Committee as the Tutorial Chair for the 2011 Social Computing, Behavioral-Cultural Modeling, & Prediction (SBP) Conference to be held at the University of Maryland in College Park, March 28-April 1. Last year, she with Center Associate Dr. Patrick Qiang presented a tutorial at the SBP 2010 Conference, which took place at the National Institutes of Health (NIH), on the theme of their book, *Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain World*.



Confirmed tutorial givers and their tutorial titles at SBP 2011 are: Dr. Alex "Sandy" Pentland of the Media Lab at MIT: "Kith and Kin: How Social Networks Make Us Smart;" Dr. Patty Mabry of NIH and Dr. Nate Osgood of the University of Saskatchewan: "Public Health Concepts: An Introduction for Modelers;" Dr. Allen Tien of MDLOGIX and two team members: "Social Network Analysis of Personal and Group Networks, " and Dr. Jarideep Srivastava of the University of Minnesota: "Behavioral Informatics: Data Management and Mining Techniques Enabling Computational Behavioral Science."



Also, make sure to mark your calendars – the first Northeast Regional INFORMS Conference will take place at UMass Amherst, May 6-7, 2011. Dr. Hari Balasubramanian of the Department of Mechanical and Industrial Engineering at UMass Amherst is the Conference Chair and Dr. Les Servi of MITRE and Tamas Terlacky of Lehigh University are the Program Co-Chairs. Professor Anna Nagurney is on the

Program Committee and is organizing the Networks cluster. As part of this cluster, Center Associates Dr. Zugang Liu and Dr. Patrick Qiang are organizing sessions on, respectively, *Risk Management: Interfaces Between Finance and Operations* and *Supply Chains: Healthcare Delivery Optimization*. Doctoral Student Center Associates Amir Masoumi and Min Yu will be presenting their recent research on critical needs supply chains and blood supply chains, respectively, at this conference. The conference website is:

<http://meetings.informs.org/RegionalNortheastern2011>



## The Venue of the Supernetwork Conference in Shanghai

The IEEE Conference on Supernetworks and System Management will take place May 29-30, 2011 in Shanghai, China.

The University of Shanghai for Science and Technology (USST) will be the venue for the conference.

Professor Anna Nagurney is serving as the Honorary Chair of the conference along with Professor WANG Ying-Luo, who is a Fellow of the Chinese Academy of Engineering.

The Conference Co-Chairs are Center Associate Professor June Dong of the State University of New York at Oswego and Professor XU Fu-Yuan of USST.

The Program Committee Chair is Professor MA Liang of USST and Professor June Wei of the University of West Florida is the Academic Committee Chair.

Professor SUN Shao-Rong of USST and Center Associate Professor Patrick QIANG of the Pennsylvania State University Great Valley are the Organization Committee Co-Chairs.

It is very exciting to see the prominence that supernetworks and associated research is getting in China.



Professor Nagurney will be one of the keynote speakers at this conference and is very much looking forward to the conference!

For information on these and other upcoming conferences, please [click on this link](#).

## Transportation Research Board Panel on Disaster Recovery and Mitigation Planning and Resilience in DC

The Center Director Professor Anna Nagurney has accepted an invitation to be on the *Disaster Recovery and Mitigation Planning and Resilience* panel that will take place at the [Transportation Research Board \(TRB\) meeting January 23-27, 2011 in Washington, DC](#). This will be the 90th annual TRB meeting and about 10,000 transportation professionals from around the world are expected to attend!

This panel is sponsored by the Planning and Environment - Group; the Policy and Organization - Group, and the Committee on Critical Transportation Infrastructure Protection.

The motivation for holding such a panel is as follows. Transportation systems throughout the world are greatly affected by natural disasters and human-created events. These systems are critical for daily activities and the economy. The magnitude of the U.S. transportation infrastructure makes protecting it extremely challenging and costly. This special session highlights innovative approaches to disaster recovery planning and assesses improving transportation infrastructure resilience to extreme events.

Joining Professor Nagurney on the panel will be Jeffrey L. Western, Western Management and Consulting, LLC, Rae Zimmerman, New York University, and Herby Lissade, California Department of Transportation, with Pamela Murray-Tuite, Virginia Polytechnic Institute and State University, presiding.

The title of Nagurney's panel presentation: *Building Resilience into Fragile Transportation Networks in an Era of Increasing Disasters*.

The TRB is one of six major divisions of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance, and which is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine.

According to the TRB website: *The mission of*

*the Transportation Research Board is to provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multimodal. The Board is supported by state transportation departments, federal agencies including the component administrations of the U.S. Department of Transportation, and other organizations and individuals interested in the development of transportation.*



**Drs. Qiang and Nagurney with their Book**

Last year, Center Associate [Dr. Patrick Qiang](#), [received the Charles V. Wootan award](#) from the Council of University Transportation Centers at the 2010 TRB meeting for his doctoral dissertation. The book that we co-authored: [Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain World](#), John Wiley & Sons, 2009, [was noted in TR News last year](#).

## Kudos and News

Congratulations to Center Associate Dr. Ke Ke of Central Washington University! She has had several papers accepted for publication:

H. Zhang, K. Ke, W. Li, and X. Wang, **Graphical Models based Hierarchical Probabilistic Community Discovery in Large-Scale Social Networks**, to appear in the *International Journal of Data Mining, Modelling and Management* and K. Liao, Z. Ma, J. Lee and K. Ke, **Achieving Mass Customization through Trust-Driven Information Sharing: A Supplier's Perspective**, to appear in the *Management Research Review*.

In addition, her paper, **Two Models of Virtual Transfer Pricing Mechanisms in Global Supply Chain**, with co-authors: Kun Liao of Central Washington University, Eldon Johnson of Central Washington University, and Yan Wang of the US Civilian Research & Development

Foundation, received a Distinguished Paper Award at the 2010 DSI Meeting in San Diego.

Dr. Tina Wakolbinger, who received her PhD in May 2007 from the Isenberg School, with a concentration in Management Science, has accepted a Full Professorship offer. She will be joining the University of Economics and Business on May 15, 2011 as a Full Professor of Management of Supply Chain Services and Networks in the Department of Cross-Border Business. The institute that she will be affiliated with is the Institute for Transport and Logistics Management.

She will be leaving her position as an Assistant Professor at the Fogelman College of Economics and Business at the University of Memphis on May 12. We congratulate Dr. Wakolbinger on her outstanding new academic position!

We also congratulate her on her paper, with Professor Fuminori Toyasaki of York University, **The Impact of Funding Systems on Humanitarian Operations**, which is an invited chapter for the book, *Humanitarian Logistics*, M. Christopher and P. Tatham, Editors, Kogan Page (2011). Together with Professor Anna Nagurney, they have also co-authored the paper, **The Influence of Technical, Market and Legislative Drivers on WEEE Recycling**, which is now under review.

Speaking of electronic recycling and sustainability, Center Associate Professor Ladimer S. Nagurney of the University of Hartford, delivered a presentation on **E-Cycling**, for the *Our Campus – Our Planet* initiative at the University of Hartford, which was covered by the local media. The work of Professor Ladimer Nagurney and his students was also featured in the October issue of *Above Ground Level*, the trade magazine of the cell tower industry. Professor Ladimer Nagurney's students looked at the societal, regulatory, economic, and ethical design of cell towers.

Dr. Zugang "Leo" Liu's paper, **Supply Chain Outsourcing Under Exchange Rate Risk and Competition**, co-authored with Dr. Anna Nagurney, has been accepted for publication in *Omega*. They have also completed the paper, **Risk Reduction and Cost Synergy in Mergers and Acquisitions via Supply Chain Network Integration**, which is now under review.

Congratulations are in order to Drs. Patrick Qiang and Trisha Woolley Anderson! Their paper, **Multiproduct Supply Chain Horizontal Network Integration: Models, Theory, and Computational Results**, with Anna Nagurney, was selected by the editors as a leading article in *International Transactions in Operational Research* (2010), **17**, 333-349.

Center Associate Dr. Ding Zhang of the School of Business at SUNY Oswego is on a year's sabbatical leave. He is spending a substantial time in China and while there taught a very successful EMBA course on logistics and supply chain management.



**The Work-Life Balance Panel  
(l-r) Drs. Kulturel-Konak, Nagurney, Wortman, Sofer, Keskin, and Seiford**

Professor Anna Nagurney spoke on two invited panels at the INFORMS National Meeting in Austin, Texas: the [social networking panel](#) and the [work and life balance panel](#) that she very much enjoyed participating in. She thanks the organizers of these two panels: Professor Laura McLay of the Virginia Commonwealth University, who organized the social networking panel, and Professors Sadan Kulturel-Konak of Penn State Berks and Burcu Keskin of the University of Alabama, who organized the work-life balance panel.

There was extensive news coverage following the publication of Professor Anna Nagurney's paper, **The Negation of the Braess Paradox as Demand Increases: The Wisdom of Crowds in Transportation Networks**, with coverage in [physorg.com](#), *Homeland Security News*, and I3P (the Institute for Information Infrastructure Protection). In addition, Professor Nagurney was interviewed on this research by the radio station WFCR. Recently, she was interviewed on her research on sustainable transportation for an article in the *Daily Collegian*. Media coverage of the Supernetworks Center and its Associates can be accessed at: <http://supernet.som.umass.edu/media/media.htm>

On October 13, 2010, Dr. Kevin Fu of the Computer Science Department at UMass Amherst and Dr. Anna Nagurney headed to the Institute for Information Infrastructure Protection (I3P) meeting that was taking place at MITRE in Bedford, MA. I3P is a consortium of academic institutions, government labs, and nonprofit organizations that focuses on

information infrastructure protection. This consortium is led by Dartmouth College. Its new Research Director is Dr. Shari Pfleeger, formerly of Rand.



**The Venue of the I3P Consortium Meeting in October 2010**

UMass Amherst is a member of this consortium and Dr. Fu is the representative from UMass while Dr. Nagurney has been appointed the alternate. [The member map is available here.](#) Professor Nagurney very much enjoyed speaking with consortium members, during the two day meeting, who came from the University of Idaho, the Idaho National Laboratory, Indiana University, the University of Tulsa, Carnegie Mellon University, the U.S. Military Academy at West Point, SRI International, Cornell University, Dartmouth College, and MITRE. [You can find more information on the I3P here.](#)

Congratulations to Center Associate Professor Lan Zhao of SUNY College at Old Westbury for the publication of her paper, joint with J. Zhu: **Internet Marketing Budget Allocation: From Practitioner's Perspective**, in the *International Journal of Information Technology & Decision-Making* (2010), **9**, 779-797.

Congratulations to doctoral student, Min Yu! Her invited paper, **Fashion Supply Chain Management Through Cost and Time Minimization from a Network Perspective**, with Professor Anna Nagurney, will appear as the leading chapter in the book, *Fashion Supply Chain Management: Industry and Business Analysis*, Jason Choi, Editor, IGI Global, Hershey, Pennsylvania. In addition, her paper, **Supply Chain Network Design for Critical Needs with Outsourcing**, co-authored with Drs. A. Nagurney and Patrick Qiang, is now in press in the journal *Papers in Regional Science*.

We congratulate Center Associate doctoral student Amir Masoumi for the completion of the paper, **Supply Chain Network Operations Management of a Blood Banking System with Cost and Risk Minimization**, co-authored with Professor Anna Nagurney and Min

Yu. As part of this research, Mr. Masoumi conducted extensive interviews with representatives from the Red Cross.

Doctoral Student Center Associate Nathan Kollett is serving as President of the UMass Amherst INFORMS Student Chapter. This semester he helped to organize the trip to the Boston INFORMS Chapter meeting at which Professor Anna Nagurney spoke and helped to organize several chapter events, including the party at which the chapter celebrated its Magna Cum Laude Award and the end of the semester party. In addition, he has expanded the chapter's social networking activities by creating both a chapter Facebook account and a Twitter account.



**UMass Amherst INFORMS Student Chapter president and Center Associate Nathan Kollett (l) with guests at the end of the semester party on December 10, 2010**

## Recent Center Publications

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

**The Negation of the Braess Paradox as Demand Increases: The Wisdom of Crowds in Transportation Networks**, A. Nagurney, *Europhysics Letters* (2010), **91**, 48002, p1-p5.

**Optimal Supply Chain Network Design and Redesign at Minimal Total Cost and Demand Satisfaction**, A. Nagurney, *International Journal of Production Economics* (2010), **128**, 200-208.

**Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age**, A. Nagurney and Q. Qiang (2010), *International Transactions in Operational Research*, in press.



**Supply Chain Network Design for Critical Needs with Outsourcing**, A. Nagurney, M. Yu, and Q. Qiang, *Papers in Regional Science* (2010), in press.

**Supply Chain Outsourcing Under Exchange Rate Risk and Competition**, Z. Liu and A. Nagurney (2010), to appear in *Omega*.

**Fashion Supply Chain Management Through Cost and Time Minimization from a Network Perspective**, A. Nagurney and M. Yu (2010), to appear in *Fashion Supply Chain Management: Industry and Business Analysis*, Jason Choi, Editor, IGI Global, Hershey, Pennsylvania.

**Sustainable Supply Chain Network Design: A Multicriteria Perspective**, A. Nagurney and L. S. Nagurney, *International Journal of Sustainable Engineering* (2010), **3**, 189-197.

**An Integrated Framework for the Design of Optimal Web Banners**, L. Hai, L. Zhao, and A. Nagurney, *Netnomics* (2010), **11**, 69-83.

**Multiproduct Supply Chain Horizontal Network Integration: Models, Theory, and Computational Results**, A. Nagurney, T. Woolley, and Q. Qiang, *International Transactions in Operational Research* (2010), **17**, 333-349.

**Supply Chain Network Design Under Profit Maximization and Oligopolistic Competition**, A. Nagurney, *Transportation Research E* (2010), **46**, 281-294.

**Environmental Impact Assessment of Transportation Networks with Degradable Links in an Era of Climate Change**, A. Nagurney, Q. Qiang, and L. S. Nagurney, *International Journal of Sustainable Transportation* (2010), **4**, 154-171.

**Formulation and Analysis of Horizontal Mergers Among Oligopolistic Firms with Insights into the Merger Paradox: A Supply Chain Network Perspective**, A. Nagurney, *Computational Management Science* (2010), **7**, 377-401.

**Multiproduct Supply Chain Network Design with Applications to Healthcare**, A. Nagurney, M. Yu, and Q. Qiang (2010), submitted.

**A Bi-Criteria Measure to Assess Supply Chain Network Performance for Critical Needs Under Capacity and Demand Disruptions**, Q. Qiang and A. Nagurney (2010), submitted.

**Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium Reformulation**, Z. Liu and A. Nagurney (2010), submitted.

**Risk Reduction and Cost Synergy in Mergers and Acquisitions via Supply Chain Network Integration**, Z. Liu and A. Nagurney (2010), submitted.

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

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

**We wish everyone a wonderful new year for 2011!**

#### 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. Zungang "Leo" Liu  
Dr. Dmytro Matsypura  
Dr. Ladimer S. Nagurney  
Dr. Qiang "Patrick" Qiang  
Dr. Padma Ramanujam  
Dr. Stavros Siokos  
Dr. Tina Wakolbinger  
Dr. Trisha Woolley  
Dr. Ding Zhang  
Dr. Lan Zhao

#### Doctoral Students

Nathan Kollett  
Amir Masoumi  
Min Yu

#### Center Website:

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

If you would like to be put on our email list, contact: [supernet@som.umass.edu](mailto:supernet@som.umass.edu)