



# The Supernetwork Sentinel

## Fall 2012

Welcome to the Fall 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 recent promotions with tenure, international teaching experiences, and other accomplishments of the Center Associates as well as exciting upcoming conferences. As always, we 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>



**Doctoral Student Center Associates with Professor Anna Nagurney in the Supernetworks Lab**

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**Professor Anna Nagurney at the School of Business, Economics and Law graduation ceremonies in Gothenburg, Sweden, June 14, 2012**

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## Center Director Gives Commencement Speech in Sweden



**The School of Business, Economics and Law Master's graduation ceremony**

On June 14, 2012, Center Director Dr. Anna Nagurny delivered a commencement speech to the Master's degree recipients at the School of Business, Economics and Law at the University of Gothenburg in Sweden. In 2012, she was appointed a Visiting Professor of Operations Management at the school and has already had two extended visits there. She will be at the University of Gothenburg for several visits during the 2012-2013 academic year while she is on sabbatical from the Isenberg School of Management at UMass Amherst.



**Professor Anna Nagurny after her speech and the graduation**

Her commencement speech was entitled *Life as a Network*.

[The full text of her commencement speech can be downloaded here.](#)

Additional information on the graduation with photos can be accessed on [the school's website](#).

## Recent Promotions with Tenure

2012 has been quite an eventful year for several graduates of our Isenberg School of Management PhD track in Management Science program at UMass Amherst and Center Associates.



Center Associate Professor Jose M. Cruz of the School of Business at the University of Connecticut Storrs (who has 5 UMass Amherst degrees) [has been named an Ackerman Scholar](#). He also was promoted to Associate Professor with tenure at the School of Business at the University of Connecticut Storrs.

In addition, Center Associate Professor Ke "Grace" Ke was also promoted to Associate Professor with tenure at the College of Business at Central Washington University.

Plus, former Center Associate Dr. Fuminori Toyasaki was promoted to Associate Professor with tenure at the School of Administrative Studies at York University in Toronto, Canada. Prior to joining the faculty at York University, He had had a two year postdoc at McGill University in Montreal and worked there with our esteemed colleagues, Professor Vedat Verter and Professor Tamer Boyaci.

In the photo above, from a few years back, the Center Director is standing with (l-r) Dr. Fuminori Toyasaki, Dr. Tina Wakolbinger (who is now a Full Professor at the Vienna University of Economics and Business), Dr. Ke "Grace" Ke, Dr. Jose M. Cruz, celebrating the visit of Dr. Patrizia Daniele of Italy and her husband, along with Dr. Dmytro Matsypura (who a year or so ago received tenure at the University of Sydney), and Dr. Zugang "Leo" Liu of Penn State University Hazleton.

## Welcoming New Doctoral Student Center Associates

This Fall, we welcomed two new Doctoral Student Center Associates. Shivani Shukla is a new doctoral student in Management Science and will be working with Professor Anna

Nagurney. She has an excellent background in statistics and transportation.

Sara Saberi will also be working as a new doctoral student in the Isenberg School with the center Director and is funded by the National Science Foundation (NSF) grant on which Professor Nagurney is a Co-PI. More information on the project follows in this newsletter.



**(l-r) Professor Nagurney, Dong "Michelle" Li, Amir Masoumi, Shivani Shukla, Sara Saberi**



**Center Associate Professor Min Yu at the University of Portland**

We also bade "farewell" to Dr. Min Yu, who will still be serving as a Center Associate but in her new role as an Assistant Professor and Pamplin Fellow at the Pamplin School of Business at the University of Portland in Oregon. Dr. Yu received her PhD with a concentration in Management Science at the UMass Amherst graduation in May 2012. We congratulate her on her tenure-track appointment!

## **NSF Research Project Attracts Attention**

One of the best aspects of our National Science Foundation (NSF) project ["Collaborative](#)

[Research: Network Innovation Through Choice](#)," is the numerous discussions that the investigators have been having. We (UMass Amherst, NCState, the University of Kentucky, and RENCi) have regular teleconferences and groups of us have met face to face at our respective institutions and at NSF events.

The discussions that we have had on our project are always stimulating and it is interesting to see how well we can communicate even though we represent different disciplines. Professor Anna Nagurney admits that she gets a special thrill when she hears terms that she often uses in her network and supply chain research being used by computer scientists and engineers such as: perishable to robustness to network vulnerability to most efficient routing to, of course, a lot of network economics terms. Professor Anna Nagurney has been working with two doctoral students on modeling the behavior of the interactions among the decision-makers on what we are calling *the economy plane*.

In August, the [2012 ACM SIGCOMM Conference](#), took place in Helsinki, Finland.

SIGCOMM is the flagship annual conference of the ACM (Association for Computing Machinery) Special Interest Group on Data Communication (SIGCOMM) on the applications, technologies, architectures, and protocols for computer communication.

Our colleague from UMass Amherst, Professor Tilman Wolf of the Department of Electrical and Computer Engineering, presented our joint poster paper, [Choice as a Principle of Network Architecture](#) at this conference.

[Professor Wolf is the PI on this project and Professor Nagurney is the Co-PI \(for the UMass Amherst contingent\).](#)

[Our project, which is called Choicenet is one of the five NSF Future Internet Architecture projects, which is quite the honor.](#)

Our project was featured in the latest [ACM Tech News](#), in an [article with the catchy title, "The Future of the Internet is ... a la Carte."](#)

NCState did the latest press release on our project.

[There is also some coverage of our project and paper by Kurzweil.](#)

## **International Teaching Experiences**

Center Associate Professor Tina Wakolbinger of the Vienna University of Economics and Business



is co-teaching a course on *Global Supply Chain Management* at the International Summer University in St. Petersburg, Russia in September. The partner university is the Graduate School of Management at St. Petersburg University with students both from that university and from Austrian Higher Education institutions.



**A group of colleagues and visitors from the School of Business, Economics and Law enjoying a lunch in June**

Professor Anna Nagurney is contributing to the course: *Theoretical Perspectives in Contemporary Business Administration Research*, which is a PhD course being offered this Fall at the School of Business, Economics and Law at the University of Gothenburg. She will be lecturing on *Operations Management and Supply Chain Network Theory* in October.

## Exciting Upcoming Conferences

Supernetwork Center Associates will be very busy presenting at the upcoming [INFORMS \(Institute for Operations Research and the Management Sciences Conference\)](#), which takes place October 14-17, 2012, in Phoenix, Arizona.

Doctoral Student Center Associate Dong "Michelle" Li will be presenting her joint paper with the Center Director, **A Dynamic Network Oligopoly Model with Product Differentiation and Quality Competition**. In addition, she will be presenting another joint paper, co-authored with Center Associate Professor Ladimer S. Nagurney of the University of Hartford, entitled, **Securing Global Medical Nuclear Supply Chains Through Economic Cost Recovery and Risk Management**.

Doctoral Student Center Associate Amir H. Masoumi will be presenting the paper, **A Supply Chain Oligopoly Model for Pharmaceuticals under Brand Differentiation and Perishability**, which was co-authored with Center Associate Professor Min Yu of the University of Portland and the Center Director.

The paper has appeared in *Transportation Research E*.

Professor Yu will also present work with Center Associate Professor Patrick Qiang of Penn State University Malvern on **Multiproduct Humanitarian Healthcare Supply Chains: A Network Modeling and Computational Framework**. He will also present the paper **Closed-loop Supply Chain with Quality Differentiation**.

Center Associate Professor Zungur "Leo" Liu of Penn State University Hazleton will be speaking on **Supply Chain Outsourcing and Quick-response Production under Demand and Cost Uncertainty**. This paper, co-authored with the Center Director, is in press in the *European Journal of Operational Research*.

Center Associate Professor Jose M. Cruz of the University of Connecticut will be speaking on **A Dynamic Model to Study Sustainable Business Policies in a Closed Loop Supply Chain and Mitigating Global Supply Chain Risks Through Corporate Social Responsibility**. He will also present the paper, co-authored with Dr. Liu: **Supply Chain Networks with Corporate Financial Risks and Trade Credits Under Economic Uncertainty**.

Center Associate Professor Dmytro Matsypura will be traveling from the University of Sydney in Australia for the conference. He will speak on **Incremental Network Design with Maximal Flow**, co-authored with Kalinowski and Savelsbergh. In addition, he will speak on Integer Programs for **Margining Option Portfolios by Option Spreads with More than Four Legs**. This is joint work with his colleague, Professor Vadim Timkovsky.

Center Associate Professor Tina Wakolbinger, in turn, will be traveling from the Vienna University of Economics and Business to speak on **An Analysis of Competition and Coalition Fundraising Strategies for Disaster Relief Operations**, joint work with Professor Fuminori Toyasaki of York University in Canada.

This conference will be a fabulous venue for a mini-reunion!

November 7-10, 2012, the Center Director will be taking part in the 59<sup>th</sup> Annual North American Meetings of the Regional Science Association International. [The conference will take place in Ottawa, Canada](#). At this conference she will be presenting **A Dynamic Network Oligopoly Model with Product Differentiation and Quality Competition**, co-authored with Doctoral Student Center Associate Dong Li.



## Kudos and News

Congratulations to Center Associate Professor Patrizia Daniele! Several [Supernetwork Center Associates](#) traveled to Orlando, Florida to speak at the [9th AIMS Conference on Dynamical Systems, Differential Equations and Applications](#), for which [Professor Patrizia Daniele of the University of Catania in Italy](#) organized a special session.



**Session speakers in Orlando, Florida**  
[The special session was SS58 and it was on Variational Analysis and Equilibrium Problems.](#)

The papers presented in this special session included research on supply chain networks and corporate financial risks by Professor Jose M. Cruz of the University of Connecticut and Professor Zugang "Leo" Liu of Penn State University at Hazleton. A paper on electric supply chains was presented by Professor Daniele, as well as a paper by her with Professors Fuminori Toyasaki of York University in Canada and Tina Wakolbinger of the Vienna University of Economics and Business on economic equilibrium problems with nonlinear constraints. Professor Wakolbinger also presented a paper on electronic waste flows, co-authored with Dr. Toyasaki and her doctoral student, Thomas Nowak, as well as Professor Anna Nagurney.

Congratulations to Center Associate Professor Jose M. Cruz. He has been appointed the Interim Director of the Business Analytics and Project Management Master's program at the School of Business at the University of Connecticut.

Congratulations to Center Associate Professor June Dong of the School of Business at SUNY Oswego. Along with her colleague, Professor Donald Cram of Accounting, Finance and Law, she received a Summer Scholar Grant for the project, "Schools Redistricting and Other Quantitative Methods Applications in Oswego Governmental Organizations" from SUNY Oswego.

Congratulations to Center Associate Professor Patrick Qiang. On May 21, 2012, he delivered the seminar, **Complex Network Performance Analysis with Applications to Transportation and Supply Chains with**

**Sustainability Implications** at Tongji University in China.



**Center Associate Professor Patrick Qiang after his seminar in China**

On June 18, 2012, the Center Director presented a seminar at the Royal Institute of Technology (KTH) in Stockholm, Sweden. She was hosted by Professor Lars-Goran Mattsson. Her seminar was on **Perishable Product Supply Chains in Health Care: Models, Analysis, and Computations**. Her presentation slides [can be downloaded here.](#)



**Dr. P-O Lindberg, Professor Nagurney, and Professor Mattsson at KTH**

Congratulations to Doctoral Student Center Associate Amir H. Masoumi who took part in the Academy of Management Doctoral Consortium in Boston in August 2012 and was accepted into the 2012 INFORMS Future Academicians Colloquium, which will take place prior to the INFORMS National Meeting in Phoenix.

Congratulations to Center Associate Professor Ladimer S. Nagurney. He has been elected a Fellow of the Radio Club of America and will receive his award in ceremonies in New York City in November.

Congratulations to Doctoral Student Center Associate Michelle Li for being elected Treasurer of the UMass Amherst INFORMS Student Chapter. Last year, Michele served as the chapter's President.

Congratulations to Center Associate Dr. Stavros Siokos. Dr. Siokos is the CEO at Sciens, based in London, England. His paper, **Fund of Hedge Fund Portfolio Construction Process in the New Era of Risk**, with Alex Allen, has been accepted for publication in the *International Journal of Portfolio Analysis and Measurement*.

We hope that you can join us for Dr. Davit Khachatryan's presentation on September 21, 2012 at 2PM at the Isenberg School of Management. His talk is being hosted by the UMass Amherst INFORMS Student Chapter. Professor Anna Nagurney has served for 8 years as the Faculty Advisor of this award-winning chapter.



Kudos to all the Center Associates on the journal article acceptances. Several have now made various journals' most downloaded lists!

## Recent Center Publications

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

**Competitive Food Supply Chain Networks with Application to Fresh Produce**, M. Yu and A. Nagurney, *European Journal of Operational Research* (2012), in press.

**Medical Nuclear Supply Chain Design: A Tractable Network Model and Computational Approach**, A. Nagurney and L. S. Nagurney, *International Journal of Production Economics* (2012), in press.

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

**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*, in press.  
**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.

**A Game Theoretical Approach to the Vertical Coexistence of Small and Big Fish**, C. Mullon and A. Nagurney (2012), *Ecological Modelling*, 240, 41-48.

**Supply Chain Network Operations Management of a Blood Banking System with Cost and Risk Minimization**, A. Nagurney, A. Masoumi, and M. Yu, *Computational Management Science* (2012), **9(2)**, 205-231.

**Multiproduct Humanitarian Healthcare Supply Chains: A Network Modeling and Computational Approach**, A. Nagurney, M. Yu, and Q. Qiang (2012), *Proceedings of the 23rd*

Annual POMS Conference, Chicago, Illinois, April 20-23, 2012.

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

**A Dynamic Network Oligopoly Model with Transportation Costs, Product Differentiation, and Quality Competition**, A. Nagurney and D. Li (2012), submitted.

**A Supply Chain Network Game Theoretic Framework for Time-Based Competition with Transportation Costs and Product Differentiation**, A. Nagurney and M. Yu (2012), submitted.



**The UMass Amherst INFORMS Student Chapter election get-together on September 12, 2012 at the Isenberg School of Management**

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

**We wish everyone a fabulous new academic year!**

#### **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. Zupang "Leo" Liu  
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  
Amir H. Masoumi  
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](mailto:supernet@isenberg.umass.edu)