

# The Supernetwork Sentinel

## Winter 2014

Welcome to the Winter 2014 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 exciting talks that we have given, guest lectures and speakers, accolades, 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  
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**Former Center Associate Isenberg Alumna Christina Calvaneso at the Inaugural Women in Business Conference at the Isenberg School on February 8, 2014**

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## Hosting Dr. Mary Helander of IBM

On November 22, 2013, at the Isenberg School of Management, we had the distinct pleasure of hosting Dr. Mary Helander of IBM Yorktown Heights. Her visit was part of the UMass Amherst INFORMS Speakers Series. The event was entitled: *Q&A: Meet the Master Inventor and Research Scientist Dr. Mary E. Helander*

Dr. Helander is on the program committee of [the INFORMS Conference on Business Analytics and Operations Research that takes place in Boston](#) in early spring 2014. She is a Master Inventor and Research Scientist and is currently the IBM Research Division leader for Consumer Products. Presently, she is the technical lead for two interdisciplinary research projects involving food safety and traceability. Not only does she hold a PhD in Operations Research but she is also a Docent in Quality and Software Engineering from Linköping University in Sweden.

Dr. Helander told the students that they could ask her *any* question.

The event was very interesting, informative, and interactive. We thank Dr. Helander for sharing her valuable time and professional experiences with us!



**Dr. Helander with students and Professor Anna Nagurney**

## Professor Anna Nagurney Speaks at TEDx UMass Amherst

Professor Anna Nagurney was one of several faculty nominated and invited to speak at TEDx UMass Amherst, which took place November 25, 2013. Her talk was entitled: *On the Traffic Circle of Life*.

The Isenberg School of Management provided a [nice summary](#) of the 3 Isenberg School of

management faculty of the school who spoke at this special event.



**Professor Anna Nagurney speaking at TEDx**

Several Doctoral Student Center Associates were in the audience.



**(l-r) Sara Saberi, Shivani Shukla, and Dong Li**

Professor Nagurney's TEDx presentation can be downloaded from the link below.

[http://supernet.isenberg.umass.edu/visuals/TEDxUMassAmherst\\_Nagurney\\_Talk.pdf](http://supernet.isenberg.umass.edu/visuals/TEDxUMassAmherst_Nagurney_Talk.pdf) A video of the presentation is available on the link: <http://vimeo.com/82305923>

## Doctoral Student Center Associate Sara Saberi Receives Isenberg Scholar Award

Sara Saberi is one of ten recipients of the prestigious 2014 Isenberg Scholar Awards and one of only three Isenberg School of Management doctoral students recognized with this award in 2014. [As noted on the Isenberg School website:](#) Established in 1995 by Eugene '50 and Ronnie Isenberg, the annual scholarships of up to \$10,000 per awardee recognize outstanding graduate students who are committed to the integration of science, engineering, and management. The three

Isenberg Ph.D. Students join an elite group of 135 Isenberg Scholars who over the past 19 years have excelled as managers, entrepreneurs, academics, and technologists.

The Center Director acknowledges the sad news of the passing of Mr. Eugene Isenberg on March 16, 2014. His generosity and philanthropy had left a lasting legacy. We express our deepest condolences to his family.

Along with Doctoral Student Center Associate [Dong "Michelle" Li](#), Sara and the Center Director continue to work on the NSF-funded project: [Network Innovation Through Choice](#). They have several papers accepted for publication or in press that acknowledge support from this major NSF grant. Professor Tilman Wolf of the Department of Electrical and Computer Engineering at UMass Amherst is the PI and Professor Anna Nagurney a Co-PI. Other partners on this project include collaborators at the University of Kentucky, NCState, and RENCi.

## Fabulous Conferences

Since the INFORMS Annual Conference that took place in October 2013 in Minneapolis, which we reported on in our Fall 2013 newsletter, research conducted by Supernetwork Center Associates has been presented at several conferences.

In mid- November, the Center Director traveled to Atlanta, Georgia, to take part in the 60<sup>th</sup> Annual North American Meetings of the Regional Science Association International (RSAI).

At this conference, she delivered the paper, [An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty](#), co-authored with Center Associates Professor Amir H. Masoumi of Manhattan College and Professor Min Yu of the University of Portland. This paper was presented in a special memorial session in honor of the Founder of Regional Science, Professor Walter Isard.

The Center Director concur with Professor David Plane's statement about the scholarship and collegiality surrounding the discipline of regional science and she would also add that many of its senior members are also terrific advocates of colleagues, both junior and senior.

It was great to see friends from around the globe and to get such positive and worthwhile comments on the papers presented. This conference has a very nice model of also having a discussant for a paper.

Professor Walter Isard would have been very proud at the success of this conference and to

see his amazing legacy living on [after his passing](#).



**Speakers and discussants at the Memorial Session**

In addition, Professor Anna Nagurney organized a special session in honor of Professor David E. Boyce's 50th consecutive attendance at this conference, dating back to his first in 1964!



**(l-r) Drs. Nie, Nagurney, Boyce, Bar-Gera, Kim, and Donaghy at the Boyce session**

In mid-February, Professor Nagurney spoke at the [Learning and Intelligent Optimization \(LION 8\) Conference in Gainesville, Florida](#).

She presented the paper, "Equilibria and Dynamics of Supply Chain Network Competition with Information Asymmetry in Quality and Minimum Quality Standards," Doctoral Student Center Associate, Dong "Michelle" Li.

Conferees at the conference came not only from North America but also from Europe and from Asia.

The conference was organized by Professor Panos M. Pardalos. The venue and weather were simply fabulous!



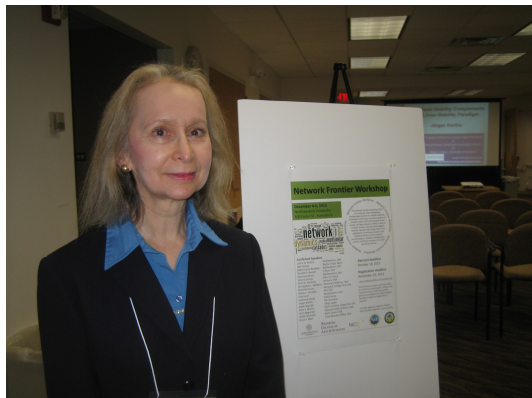


**The Center Director with Dr. Kalyagin and Dr. Pardalos in Gainesville**

## **Professor Anna Nagurney is Keynote Speaker at Network Frontiers**

Dr. Adilson Motter invited the Center Director to speak at the 2013 Network Frontier Workshop that he was organizing at [Northwestern University](#). This workshop was a huge success and took place December 4-6, 2013, highlighting leading-edge research on complex networks. [According to the workshop website](#): *Participants working on innovative aspects of complex systems will communicate recent results and ideas relevant to fields as diverse as brain, climate, and socio-technological research. Sessions will include theory and applications of nonlinear dynamics and statistical physics in the context of synchronization, cascades, transportation, control, and failure recovery in complex dynamical systems.*

Her presentation was on "Envisioning a Future Internet Architecture: The Network Economics of ChoiceNet." The presentation was based on the NSF multi-university project: *Network Innovation Through Choice*.



**Professor Anna Nagurney at the Northwestern Network Frontiers Conference**

## **Humanitarian Logistics Course Garners Media Attention**

This semester, the Center Director is offering, for the second time at UMass Amherst, a course on *Humanitarian Logistics and Healthcare*, with [the syllabus available here](#). The course has attracted students from the Isenberg School of Management, the School of Public Health, and the College of Engineering. One of the highlights of the course is the speakers that come to share their experiences with the students.

This semester the guest speakers are: Mr. Jeff Hescocock, the Director of Emergency Preparedness and Business Continuity at UMass Amherst, Mr. Rick Lee, the Executive Director of the Pioneer Valley Chapter of the Red Cross, Dr. Pierre Rouzier, a sports medicine doctor at UMass' UHS, who has assisted both in Haiti post the 2010 earthquake, and during last year's Boston Marathon bombing on April 15, 2013, Mr. Dave Madsen a celebrated TV journalist at WGGB, and Center Associate Professor Ladimer S. Nagurney of the University of Hartford who spoke on disaster communications.

The Isenberg School of Management featured Professor Nagurney's course in a two part series which can be viewed [here](#) and [here](#).

Professor Nagurney publicly thanked the guest speakers to that point in a Guest Editorial: [Community experts enhance disaster Management education as guest lecturers at the Isenberg School of Management](#).



**Mr. Rick Lee of the Red Cross with students in the Humanitarian Logistics and healthcare class**

## **Kudos and News**

Doctoral Student Center Sssociate Dong "Michelle" Li successfully defended her doctoral dissertation proposal entitled: "Quality Competition in Supply Chain Networks with



Applications to Information Asymmetry, Product Differentiation, and Outsourcing,” on February 21, 2014. We congratulate Michelle on this big achievement! Michelle's concentration at the Isenberg School of Management is in Management Science.



**Michelle with her doctoral committee members after her proposal defense**

Also, we are pleased to announce that Michelle was selected to take part in the POMS Doctoral Consortium that will take place in Atlanta, Georgia in early May 2014. At the conference she will also present the paper, co-authored with Professor Anna Nagurney: "Equilibria and Dynamics of Supply Chain Network Competition with Information Asymmetry in Quality and Minimum Quality Standards," which was recently accepted for publication in a special issue of the journal *Computational Management Science*.

Center Associates Professors Amir H. Masoumi and Min Yu have had their paper, "An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty," accepted for presentation at the [Humanitarian Technology: Science, Systems and Global Impact 2014](#), Boston, MA, May 13-15, 2014. Dr. Masoumi will also be presenting this paper at the POMS Conference in Atlanta.

Doctoral Student Center Associate Sara Saberi will also be at the POMS Conference in Atlanta and will present the paper: "A Network Economic Game Theory Model of a Service-Oriented Internet with Price and Quality Competition," which is co-authored with the Center Director and Professor Tilman Wolf.

Professor Min Yu will present the paper, "Competitive Food Supply Chain Networks with Application to Fresh Produce," also co-authored with the Center Director, at POMS. This paper was published in the *European Journal of Operational Research* last year.

Professor Anna Nagurney was reappointed a Visiting Professor for 2014 at the School of Business, Economics and Law (for a third

successive year) at the University of Gothenburg in Sweden. She spent 10 days there in mid-March 2014 and plans to return after the academic semester is completed at UMass Amherst.



**Some of the colleagues enjoying a coffee break in the office suite in Gothenburg**

Doctoral Student Center Associate Shivani Shukla who is serving as President of the UMass Amherst INFORMS Student Chapter this year has been very active organizing activities. She helped to organize a panel on teaching and invited several speakers who presented their research in March and April 2014.



**Panelists and participants in the Teaching Panel on March 7, 2014 at the Isenberg School**

Center Associate Professor Jose M. Cruz of the School of Business at the University of Connecticut is on sabbatical the spring 2014 semester. He has visited Center Associate Professor Dmytro Matsypura at the University of Sydney in Australia and is also visiting universities in Cape Verde. He continues to serve as the Program Director of the very successful Master's program in Business Analytics and Project Management.

Doctoral Student Center Associate Shivani Shukla accompanied the Center Director to the INFORMS Analytics Conference, which took place in Boston, Massachusetts, March 30-April 1, 2014. The Center Director was one of thirty speakers, not including two keynoters who were selected via a competitive process to present their research. The title of her presentation was: "Cybersecurity and Financial Services." Her presentation [can be downloaded here.](#)



**(l-r) Shivani Shukla, Dr. Milad Ebtahaj, and Michael Prokle, with Professor Nagurney**

We congratulate former Undergraduate Student Center Associate Christina Calvaneos, who received her degree from the Isenberg School of Management in 2003 on her selection for the Isenberg's Business Leadership Young Alumna Award. Ms. Calvaneos will receive this award, only the second time that it is being given, at the Isenberg Business Leadership banquet, which will be held at the Collonnade Hotel in Boston, June 18, 2014. Professor Anna Nagurney nominated her for this award. For a full list of Center Associates, including alums, please visit the [Supernetwork website Center Associate page.](#)

The Center Director had the pleasure of seeing Ms. Calvaneos at the Isenberg School's Inaugural Women in Business Conference that took place on February 8, 2014. Christina was a panelist at this event.

## Recent Center Publications

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

**A Supply Chain Network Game Theoretic Framework for Time-Based Competition with Transportation Costs and Product Differentiation**, A. Nagurney and M. Yu, in press in *Optimization in Science and Engineering - In Honor of the 60th Birthday of Panos M. Pardalos*, edited by Th. M. Rassias, C. A. Floudas, and S. Butenko,, Springer, New York, (2014).

### **An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty**

A. Nagurney, A.H. Masoumi, and M. Yu. in press in *Regional Science Matters: Studies Dedicated to Walter Isard*, edited by A. Rose, P. Nijkamp, and K. Kourtit, Springer, Heidelberg, Germany (2014).

### **A Dynamic Network economic Model of a Service-Oriented Internet with Price and Quality Competition**

A. Nagurney, D. Li, S. Saberi, and T. Wolf, in press in *Network Models in Economics and Finance*, edited by G. Bautin, Th. M. Rassias, and P.M. Pardalos, Springer, Berlin, Germany (2014).

### **Supply Chain Network Sustainability Under Competition and Frequencies of Activities from Production to Distribution**

A. Nagurney, M. Yu, and J. Floden, *Computational Management Science* (2013), **10(4)**, 397-422.

### **Supply Chain Networks with Global Outsourcing and Quick-Response Production Under Demand and Cost Uncertainty**

Z. Liu and A. Nagurney, *Annals of Operations Research* (2013), **208(1)**, 251-289.

### **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), **20(6)**, 859-888.

### **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), **14(1-2)**, 1-25.

### **Supply Chains and Transportation**

**Networks**, A. Nagurney, *Handbook of Regional Science* (2014), M. Fischer and P. Nijkamp, Editors, Springer, Berlin, Germany, pp 787-810.

### **ChoiceNet: Network Innovation Through Choice**

G. N. Rouskas, I. Baldine, K. Calvert, R. Dutta, J. Griffioen, A. Nagurney, and T. Wolf, invited paper for the 17th Conference on Optical Network Design and Modeling (ONDM 2013), Brest, France.



**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.

**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.



**The Center Director with Doctoral Student Center Associate Shivani Shukla at the Boston INFORMS Analytics conference**

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

### **Center Director 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:**

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