

The Supernetwork Sentinel

Summer 2014

Welcome to the Summer 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 recognitions and accolades received, conference presentations, visiting professorship and organizing activities, and other news.

As always, we also include a list of our recent Center publications. We thank you for your support.

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Doctoral Student Center Associate Sara Saberi and Professors Anna Nagurny at the Isenberg School Scholarship Awards Gala, April 24, 2014

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View from Center Director's office at the School of Business, Economics and Law at the University of Gothenburg, Sweden, where she is a Visiting Professor

Doctoral Student Center Associate Dong "Michelle" Li Receives Isenberg Outstanding Doctoral Student Researcher Award

On May 1, 2014, Doctoral Student Associate Dong "Michelle" Li was recognized for her research by the Isenberg School PhD program at the University of Massachusetts Amherst with a 2014 Outstanding Doctoral Student Researcher Award.



Michelle (l) with other doctoral student award recipients (teaching and research) and with PhD Director Dr. George Milne in the center



Doctoral Student Center Associate Shivani Shukla with Michelle

Michelle has co-authored papers with the Center Director and Associates, which have appeared in the journals: *Netnomics*, the *International Transactions in Operational Research*, *Computational Economics*, *Computational Management Science*, and the *International Journal of Sustainable Transportation*.

Michelle's research focuses on supply chain network competition in quality and she has examined the impacts of outsourcing and information asymmetry in this context.

Her co-authored paper, **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, which is based on research conducted under the NSF funded project on the Future Internet Architecture (FIA) program with Professors Tilman Wolf and Anna Nagurney as PI and Co-PI, respectively, was selected by *ACM Computing Reviews* in its [list of Best of 2013](#). The list recognizes *notable items published in computing*.

We congratulate Michelle on her research achievements!

Center Associates Present at the POMS Conference

The Production and Operations Management Society (POMS) held its [25th Annual Conference in Atlanta, Georgia, May 9-12, 2014](#).

The research conducted by Supernetwork Center Associates was highly visible at POMS.



(l-r) Drs. Qiang and Yu, S. Saberi, Dr. Masoumi, and D. Li

Dong "Michelle" Li, presented the paper, [Equilibria and Dynamics of Supply Chain Network Competition with Information Asymmetry in Quality and Minimum Quality Standards](#), co-authored with the Center Director. This paper was recently accepted for publication in the journal *Computational Management Science*.

Two other supply chain papers that the Center Director co-authored with Supernetwork Center Associates, were also presented: [An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty](#), co-authored with Professors Amir H. Masoumi of Manhattan College and Min Yu of the University Portland, and the other: [Competitive Food Supply Chain Networks with Application to Fresh Produce](#), M. Yu and A. Nagurney, which was published in the *European Journal of Operational Research*, (2013), **224(2)**, 273-282.

Center Associate Professor Patrick Qiang of Pennsylvania State University Malvern presented his latest work on supply chains and

sustainability: **The Closed-loop Supply Chain Network with Competition and Design for Remanufacturability**. He has done pioneering work in network vulnerability and performance assessment. This paper was recently accepted for publication in the *Journal of Cleaner Production*.

Finally, Doctoral Student Center Associate Sara Saberi presented a paper co-authored with Professor Tilman Wolf and the Center Director on work, which was also funded by the Future Internet Architecture (FIA) program at NSF. The title of that paper is: **A Network Economic Game Theory Model of a Service-Oriented Internet with Price and Quality Competition in Both Content and Network Provision**. [Our POMS presentations can be downloaded from the supernetworks site.](#)



Center Associates enjoying one another's company at dinner at POMS in Atlanta

Professor Anna Nagurney is Invited Speaker at Energy, Cities, and the Control of Complex Systems Workshop in Erice, Sicily

The Center Director Professor Anna Nagurney was an invited speaker at the [Workshop on Energy, Cities, and Control of Complex Systems organized by Drs. Adilson Motter and Robert Schock](#). The invitation-only workshop took place May 12-14, 2014 in Erice, Sicily.



Professor Anna Nagurney with Dr. Robert Schock in Erice

Dr. Motter is a Professor at Northwestern University and Dr. Schock is a Senior Fellow on Global Security Research at Lawrence Livermore Lab in Berkeley.

The venue for the workshop was the Ettore Majorana Scientific Center, which was originally 4 monasteries with the bells pealing regularly to remind us of that point.

The workshop convened physicists, engineers, transportation researchers, network scientists, a computer scientist (from IBM), as well as energy researchers, an atmospheric scientist, a statistician, several policy makers (including one from Toronto, Canada), and an operations researcher and network economist (the Center Director).



The workshop participants at a dinner in Erice

This was a multidisciplinary workshop with talks ranging from those with not a single equation to those with many beautiful equations. Quite a few of the talks were on network themes.

Professor Anna Nagurney's presentation was on [Sustainable Supply Chains for Sustainable Cities](#).

She thanks the organizers for a fabulous workshop in a magical venue!

Center Associates in Sweden

Both the Center Director and Center Associate Professor Ladimer S. Nagurney of the University of Hartford spent part of the spring and summer in Gothenburg, Sweden. Professor Anna Nagurney continued as a Visiting Professor of Operations Management at the School of Business, Economics and Law. She is in her third year of this visiting professorship appointment.

While in Sweden, she worked with collaborators there, including her co-author, Professor Jonas Floden, with whom she now has three publications, most recently, the paper, [Supply Chain Network Competition in Time-Sensitive Markets](#), A. Nagurney, M. Yu, J. Floden, and L. S. Nagurney, which we are pleased to report is now in press in the journal *Transportation Research E*.

While in Gothenburg, she also took part in a workshop of the Urban Freight Platform (UFP) at the School of Business, Economics and Law on May 26, 2014, which brought together researchers with interests in transportation and logistics from this school and also from Chalmers University.



Some of the participants in UFP

Professor Ladimer S. Nagurney, in turn, was visiting Chalmers University in Gothenburg. On June 5, 2014, he delivered an informal seminar, *TI DSK and Software Defined Radio*, which highlighted efforts in developing joint undergraduate Digital Signal Processing student projects with Chalmers. He also met with faculty in the Department of Signals and Systems to discuss future collaborations. His visit was supported by a 2013-2014 International Center Faculty Grant from the University of Hartford.



Professor Ladimer S. Nagurney in front of Chalmers

Chalmers is one of the leading Engineering Universities in Sweden producing about 40% of Sweden's engineering graduates. It is also the first University to be named after a major benefactor, William Chalmers, Director of the Swedish East India Company.

Kudos and News

Congratulations to Center Associate Dr. Trisha Woolley Anderson and to Dr. Zungang "Leo" Liu! Both were awarded tenure and promotion to

Associate Professor. Dr. Anderson is at the School of Business at Texas Wesleyan University and Dr. Liu is at Penn State University Hazleton. Dr. Liu also is the recipient of the Faculty Research Award at his university this year and Dr. Anderson received her university's Teaching Award, also in 2014.

In addition, we congratulate Professor Zungang Liu, since his paper, with C. Xie, 2014, **On the Stochastic Network Equilibrium with Heterogeneous Choice Inertia**, has been accepted for publication in *Transportation Research Part B*.

Congratulations to Center Associate Professor Jose M. Cruz of the School of Business at the University of Connecticut! He was appointed an Ackerman Scholar for 2014-2016. Dr. Cruz also held this honorific title from 2012-2014.

On April 6, the Center Director Professor Anna Nagurney had the honor and privilege of being the Guest Speaker at the UMass Amherst Campus Center Auditorium at [the Phi Kappa Phi Honor Society Induction ceremony](#). Professor Don Katzner of the Economics Department had invited her to speak close to a year ago. Since she [enjoyed the ceremony last year so much](#) she agreed. Professor Nagurney's speech was: [Our Outstanding UMass Amherst Students. Phi Kappa Phi](#), according to its website was **founded in 1897 at the University of Maine, Phi Kappa Phi is the nation's oldest, largest, and most selective collegiate honor society for all academic disciplines.**

On April 28, 2014 Professor Anna Nagurney took part in a Teaching panel, along with Professors Ana Muriel and Jenna Marquard of the Department of Mechanical and Industrial Engineering at UMass Amherst, and Professor Glenn Ellis of Smith College. The event took place in the College of Engineering and attracted students and faculty from the Isenberg School of Management and from the College of Engineering. The panelists discussed their approaches to teaching, provided helpful hints, and discussed the academic job market and the role of teaching.

On May 1, 2014, as is the tradition, we celebrated the end of the semester and academic year with a UMass Amherst INFORMS Student Chapter party. This year we had several of our alums come for a surprise visit which was delightful. As always, the international cuisine was delicious and it was great to end the academic year with animated conversations and camaraderie. Doctoral Student Center Associate Shivani Shukla was the President of this award-winning student chapter this year and we thank her for her extraordinary efforts in organizing both professional and social activities.



UMass Amherst INFORMS Student Chapter members and friends

Center Associates Professor Amir H. Masoumi presented the paper, **An Integrated Disaster Relief Supply Chain Network Model with Time Targets and Demand Uncertainty**, at the [Humanitarian Technology: Science, Systems and Global Impact 2014](#), Boston, MA, May 13-15, 2014. The paper is co-authored with Professors Anna Nagurney and Min Yu. The paper is in press in the book: *Regional Science Matters: Studies Dedicated to Walter Isard*, edited by P. Nijkamp, A. Rose, and K. Kourtit, Springer, Heidelberg, Germany (2014).

Center Associate Professor Patrick Qiang of Penn State Malvern recently visited Tongji University in Shanghai, China. While there, he attended a few seminars on supply chain management organized by the School of Economics and Management. In addition, he discussed research ideas related to multiplex networks with a few professors in their Management Science Department.

Center Associate Professor Patrizia Daniele of the University of Catania organized a minisymposium for the [18th European Conference on Mathematics in Industry: ECMI 2014](#), Taormina, Italy. This conference will take place, June 9-13, 2014. The minisymposium is on **Recent Advances on Equilibrium Problems with Applications to Networks**.

At this symposium, she will be presenting work done with Center Associate Professor Tina Wakolbinger of the Vienna University of Economics and Business in Austria and with Professor Fuminori Toyasaki of York University in Toronto, Canada. The paper that she will present was recently published in the *European Journal of Operational Research*: **A Variational Inequality Formulation of Equilibrium Models for End-of-Life Products with Nonlinear Constraints**. Professor Anna Nagurney will also present her paper, **Supply Chain Network Competition in Time-Sensitive Markets**, co-authored with M. Yu, J. Floden, and L. S. Nagurney.

In addition, Professor Toyasaki will present a paper in the same session, co-authored with Professor Tina Wakolbinger, her doctoral student, Thomas Nowak, and the Center Director: **When and for Whom Would E-Waste be a Treasure Trove? Insights from a Network Equilibrium Model of E-Waste Flows**. We are excited to report that this paper, written by three generations of scholars, has been published in the *International Journal of production Economics*. Both Professor Wakolbinger and Professor Toyasaki were Professor Anna Nagurney's doctoral students at the Isenberg School of Management.

In addition, Professor Daniele will be hosting Professor Anna Nagurney at the University of Catania when she delivers an invited seminar there on June 13, 2014.

Congratulations to Center Associates Professors Daniele and Wakolbinger. Their paper, co-authored with Professor Fuminori Toyasaki, **A Variational Inequality Formulation of Equilibrium Models for End-of-Life Products with Nonlinear Constraints**, appears in the *European Journal of Operational Research*, (2014), **236**, 340-350.

Congratulations to Center Associate Professor Min Yu. Her paper, **Fashion Supply Chain Network Competition with Ecolabelling**, with the Center Director and Professor Jonas Floden, is in press in the book, *Sustainable Fashion Supply Chain Management: From Sourcing to Retailing*, T.-M. Choi and T.C.E. Cheng, Editors, Springer, 2014. This book is the first in a new Springer series on Supply Chain Management edited by Professor C. Tang of UCLA.

Center Associate Professor Dmytro Matsypura of the University of Sydney in Australia is on the Scientific Committee of the [the Optimization, Control and Applications in the Information Age conference](#) that is in honor of the 60th birthday of Professor Panos M. Pardalos of the University of Florida Gainesville. This conference will take place in Chalkidiki, Greece, June 15-20, 2014.

Both Professor Matsypura and the Center Director Professor Anna Nagurney will be presenting papers there.

We will report on our summer activities including numerous conference presentations in the Fall 2014 edition of this newsletter.

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* (2014), **44(2)**, 201-229.

A Supply Chain Network Game Theoretic Framework for Time-Based Competition with Transportation Costs and Product Differentiation, A. Nagurney and M. Yu, 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), 381-400.

When and for Whom Would E-Waste be a Treasure Trove: Insights from a Network Equilibrium Model of E-Waste Flows, T. Wakolbinger, F. Toyasaki, T. Nowak, and A. Nagurney, *International Journal of Production Economics* (2014), **154**, 263-273.

Supply Chain Network Competition in Time-Sensitive Markets, A. Nagurney, M. Yu, J. Floden, and L. S. Nagurney, in press in *Transportation Research E* (2014).

Fashion Supply Chain Network Competition with Ecolabelling, A. Nagurney, M. Yu, and J. Floden, in press in *Sustainable Fashion Supply Chain Management: From Sourcing to Retailing*, T.-M. Choi and T.C.E. Cheng, Editors, Springer, 2014.

ChoiceNet: Toward an Economy Plane for the Internet, T. Wolf, J. Griffioen, K. Calvert, R. Dutta, G. Rouskas, I. Baldin, and A. Nagurney, *Computer Communication Review* **44(3)**, July 2014.

Equilibria and Dynamics of Supply Chain Network Competition with Information Asymmetry in Quality and Minimum Quality Standards, A. Nagurney and D. Li, in press in *Computational Management Science* (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 P. Nijkamp, A. Rose, 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.

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.

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

**Center Director
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