
The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Winter 2008



Welcome to the Winter 2008 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. Its 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 include Professor Anna Nagurney's RSAI Fellow Induction Speech. We also share information on recently received distinctive awards and recognitions and highlight exciting upcoming international activities from China to Italy. As always, we provide a list of our recent publications as well as upcoming events.

We wish everyone a wonderful New Year!

Anna Nagurney
John F. Smith Memorial Professor
Director – Virtual Center for Supernetworks
<http://supernet.som.umass.edu>



Above: The UMass Amherst INFORMS Student Chapter hosts Dr. Arnold Barnett of MIT who spoke on December 7, 2007

Right: Center Associate Dr. Stavros Siokos, Managing Director of Citigroup in London, the United Kingdom, visits the Supernetworks Laboratory prior to his presentation

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Professor Anna Nagurney's RSAI Fellow Induction Speech

Awards Luncheon at the Regional Science Association International Annual Meeting Savannah, Georgia - November 10, 2007

It is a distinct honor and privilege to be standing before you today. I am so humbled to have been selected an RSAI Fellow.

I am standing on the shoulders of intellectual giants, many of whom are in the audience today.

My work and career would not have been possible without my dissertation committee at Brown University, which included Martin Beckmann and Stella Dafermos, who was my dissertation advisor. The influence of their work spans many decades and continues to this day. Stella died tragically in 1990 at the age of 49. It was Dafermos who introduced me to the regional science community and in which I have met many wonderful colleagues and friends.

I would especially like to thank David Boyce who has been an intellectual leader and an ardent supporter of transportation network equilibrium modeling in both theory and practice. His intelligence, stamina, contributions, and sense of humor have graced our community.

I would also like to acknowledge Karen Polenske, who inspired me through her books, when I was a student, and who demonstrated to me that women can write scientific books. Her energy and trailblazing research in China are something that I keep in mind for inspiration.

Without Walter Isard we would not have the discipline of regional science nor, very likely, its many other outgrowths, as Jean H. P. Paelinck mentioned yesterday: location theory, spatial econometrics, and others. To him I am eternally grateful.

When I teach at UMass Amherst (and elsewhere) I bring photos of the scientists whose work I am discussing. When I look at the photo albums that I share with my students, the majority include photos of regional scientists at conferences -- in Australia, in Sweden, in Russia, in Greece, and elsewhere. My students have seen photos of: Geoff Hewings, Martin Beckmann, Takashi Takayama, Borje Johansson in Australia; of T. John Kim, Tony Smith, Masa Fujita, Alex Anas, Peter Nijkamp, David Batten, and David Boyce in Sweden, and of Stella Dafermos and Jean H. P. Paelinck in Greece.

My students have benefited from special sessions organized by David Boyce and myself on the 50th anniversary of the publication of the Beckmann, McGuire, and Winsten classical book, **Studies in the Economics of Transportation**, which brought together many of us to the RSAI meeting in Philadelphia, and even Suzanne Evans from England and Hani Mahmassani who is now at Northwestern.

Thank you, everyone, for this special occasion in the gorgeous venue of Savannah, Georgia.

I hope that our best research is yet to be done. Thanks for the terrific memories and let us, together, create many more!

Link to the Fellows of the Regional Science Association International website:
<http://www.regionalscience.org/CompNAwards/rsaifellowsaward.htm>

Link to the Regional Science Association International website:
<http://www.regionalscience.org/>

For background information on the Beckmann, McGuire, and Winsten book, including the online version made available recently by Yale University Press, see: <http://supernet.som.umass.edu/classics.htm>

UMass Amherst INFORMS Student Chapter garners "Summa Cum Laude" Award



At the 2007 INFORMS (Institute for Operations Research and the Management Sciences) Annual Meeting, which took place in Seattle, Washington, November 4-7, the UMass Amherst INFORMS Student Chapter received the Annual "Summa Cum Laude" Award for its various chapter activities. Several members of the Student Chapter were at the awards breakfast in which the award was announced. Christian Wernz, who served as the 2006-2007 Chapter President, Zugang "Leo" Liu, who was the 2005-2006 Chapter President, and Dayo Shittu were at the breakfast meeting and accompanied Professor Anna Nagurney, who is the chapter's Faculty Advisor. Dr. Sanjay Mehrotra of Northwestern University presented the chapter with the award. See the photo above.

This recognition is not the first for the UMass Amherst INFORMS Student Chapter. In 2005, Professor Nagurney was the recipient of the INFORMS Moving Spirit Award for her work in advising the chapter and its outstanding Speaker Series which was initiated in Fall 2004 and which brings each term a slate of 5-6 renowned speakers on topics of interest to operations researchers and management scientists. In 2006, Tina Wakolbinger, who received her PhD in 2007 with a concentration in Management Science and who is now an Assistant Professor at the Fogelman School of Business and Economics at the University of Memphis, was the recipient of the Judith Liebman award from INFORMS. Dr. Wakolbinger revitalized the Student Chapter in 2004 and served as its President and Speaker Series Coordinator for two years. Trisha Woolley, a doctoral student at the Isenberg School of Management, in the Management Science track, is the Speaker Series Coordinator for 2007-2008.

The UMass Amherst Student Chapter is noted for the esprit de corps of its members who come from different schools at UMass Amherst, including the Isenberg School of Management, the College of Engineering, and the College of Natural Sciences and Mathematics, among others, and for its social and other activities in addition to its Speaker Series.

For more information about the Student Chapter, see:

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

For more information about its Speaker Series,

<http://supernet.som.umass.edu/informs/speakernew.html>

Professor Anna Nagurney Receives the 2007 Women in Operations Research and the Management Sciences Award

On November 6, 2007, at the WOMRS (Women in Operations Research and the Management Sciences) Business Luncheon at the 2007 INFORMS Annual Meeting in Seattle, Washington, Professor Anna Nagurney received the 2007 Women in Operations Research and the Management Sciences Award. Dr. Radhika Kulkarni of SAS, who is based in Cary, North Carolina, presented the award to Professor Nagurney. Dr. Kulkarni received the WOMRS Award in 2006. This was only the third year that the award was given. Professor Nagurney was accompanied at the luncheon by the Chair of her department at UMass, Professor Iqbal Agha, and by one of her doctoral students, Zugang "Leo" Liu, who is also a Center Associate. Professor Ana Muriel of the Department of Mechanical and Industrial Engineering at UMass Amherst was also one of Professor Nagurney's guests. Dr. Kulkarni is a colleague of Dr. Padma Ramanujam's at SAS. Dr. Ramanujam is a Center Associate of the Virtual Center for Supernetworks.

For more information about the award see:

<http://supernet.som.umass.edu/media/worms-award-1107.htm>



Professor Anna Nagurney Receives the 2007 WOMRS Award from Dr. Kulkarni at the WOMRS Business Luncheon at the INFORMS Seattle Conference

International Activities from China to Italy

The 2008 term will be filled with numerous exciting international activities, which are described below.

Invited Lecture in China and Grant

Center Associate Professor June Dong of SUNY Oswego will deliver an invited talk at the Annual Meeting of the Shanghai Operations Research and Management Science Association on December 29, 2007 in China.

In addition, Professor Dong was awarded a Distinguished Scholar Exchange Award from the Shanghai Municipal Science and Technology Commission to work with Professor Zhu Detong at the Shanghai Normal University.

Plenary Lecture in New Zealand

January 7-12, 2008, Professor Anna Nagurney will be attending the 19th International Conference on Multiple Criteria Decision Making --- MCDM for Sustainable Energy and Transportation Systems, which will take place at the University of Auckland in New Zealand. On January 8, she is scheduled to deliver a plenary lecture, entitled, "Multicriteria Decision-Making for the Environment: Sustainability and Vulnerability Analysis of Critical Infrastructure Systems from Transportation Networks to Electric Power Supply Chains."



Senior Fulbright Specialist in Italy Awarded to Professor Nagurney

Professor Anna Nagurney was awarded a Senior Fulbright Specialist grant at the University of Catania in Italy. The theme of the grant is: "Complex Networks and Vulnerability Analysis: From Innovations in Theory to Education and Practice." While at the University of Catania, Professor Nagurney will present lectures at graduate and undergraduate levels; she will lead a workshop on the theme; she will be assessing academic curricula and educational materials and she will also be discussing relevant datasets. These activities will take place in Spring 2008. Professor Nagurney will be hosted by Virtual Center Associate, Professor Patrizia Daniele, while she is at the University of Catania as a Senior Fulbright Specialist. For information, see:

http://www.fulbright.it/UNIV/fulbright_ssp.asp



Rockefeller Foundation Bellagio Center Conference

May 5-9, 2008, Professor Anna Nagurney will convene the conference, "Humanitarian Logistics: Networks for Africa," at the Rockefeller Foundation's Bellagio Conference Center on Lake Como in Italy. Professor Nagurney has invited 18 speakers/participants from academia, industry, and NGOs to discuss the latest research and practice on this topic with a goal of also expanding educational resources in Africa and the US on the topic. A website for the conference is presently under development. The official Rockefeller Foundation announcement is available at:

<http://www.rockfound.org/bellagio/101707conferences.shtml>

Spring 2008 UMass Amherst INFORMS Speaker Series Announced

The lineup of speakers for the Spring 2008 series is wonderful! We are delighted to announce the following roster:

On February 22, 2008, **Professor Andrew Papachristos** of the Department of Sociology at UMass Amherst will be speaking on, "Murder Markets: Group Dominance and the Social Contagion of Gang Homicide in Chicago."

On March 7, 2008, **Professor Jenna Marquard** of the Department of Mechanical and Industrial Engineering at UMass Amherst will be delivering her talk.

On March 28, 2008, **Professor Eitan Bachmat** of Ben-Gurion University in Israel, who is visiting Brandeis University, will be speaking. The title of his talk is, "Airplane Boarding and Space-Time Geometry."

On April 4, **Professor David Wypij** of the School of Public Health at Harvard University is scheduled to give his seminar.

On April 18, **Professor John Birge** of the Graduate School of Business at the University of Chicago will be speaking. The title of his presentation is, "A News-vendor Model for Dynamic Investment and Financing Decisions: Capital Structure Implications and Empirical Results."

The above talks will take place from 11:00AM until noon in Room 112 at the Isenberg School of Management on the scheduled dates (all Fridays).

For more detailed information on the series: <http://supernet.som.umass.edu/informs/speaknew.html>

For information on the UMass Amherst INFORMS Student Chapter and additional activities, see: <http://student.som.umass.edu/informs/>

Support for this series is provided by the Isenberg School, the Department of Finance and Operations Management, the John F. Smith Memorial Fund, and INFORMS.

Kudos and News

On September 28, 2007, Dr. Stavros Siokos, Managing Director of Citigroup in London, UK, and Center Associate, spoke in the UMass Amherst Speaker Series in Operations Research / Management Science at the Isenberg School. He was also co-hosted by the Finance Seminar Series. We were delighted to have Dr. Siokos, who received his PhD from UMass Amherst in 1998, come back to his alma mater. The title of his presentation was: "Latest Trends in Global Equity Trading: The New Technology, the Players, and the New Legislation: Differences Between the US and the Rest of the World."

Professor Anna Nagurney delivered the Warren Lecture at the University of Minnesota in Minneapolis on October 5, 2007. Her hosts included Professor David Levine and Henry Liu. She enjoyed her visit to the University of Minneapolis tremendously and the hospitality extended to her. Her presentation, "Transportation Science and the Dynamics of Critical Infrastructure Networks with Applications to Performance Measurement and Vulnerability Analysis," is available at: <http://supernet.som.umass.edu/visuals.html>

October 28-November 2, 2007, Professor Tina Wakolbinger of the University of Memphis presented the paper, co-authored with Professor Jose M. Cruz, "Multiperiod Effects of Corporate Social Responsibility on Supply Chain Networks: Transaction Costs, Emissions, and Risk," at the International Conference on Complex Systems in Boston, Massachusetts. She very much enjoyed the interdisciplinarity of the conference and presentations.

On November 9, 2007, Center Associate Professor Ke "Grace" Ke gave an invited seminar, entitled: "Financial Networks with Intermediation: Risk Management with Variable

Weights," at the Sam M. Walton College of Business at the University of Arkansas in Fayetteville. She spoke in the Economics Department Seminar Series. Dr. Ke is an Assistant Professor at the School of Business at the University of Arkansas in Monticello.

Professor Dmytro Matsypura of the University of Sydney in Australia attended the 5th International Conference on Supply Chain Management and Information Systems held in Melbourne, Australia, December 9-12, 2007. At the conference he presented the paper, "Supply Chain Networks with Corporate Social responsibility through Integrated Environmental Decision-Making," co-authored with Center Associate Professor Jose M. Cruz.

For more information on the talks, conferences, and events, see: <http://supernet.som.umass.edu/conferences.html>

Recent Center Publications

Copies of these (and other) center articles are at: <http://supernet.som.umass.edu/dart.html>

A Unified Network Performance Measure with Importance Identification and the Ranking of Network Components, Q. Qiang and A. Nagurney (2008), *Optimization Letters*, **2**, pp. 127-142.

A Network Equilibrium Framework for Internet Advertising: Models, Qualitative Analysis, and Algorithms, L. Zhao and A. Nagurney, *European Journal of Operational Research* (2008), **187**, pp. 456-472.

Dynamics of Supply Chain Networks with Corporate Social Responsibility Through Integrated Environmental Decision-Making, Jose M. Cruz (2008), *European Journal of Operational Research*, **184**, pp. 1005-1031.

Robustness of Transportation Networks Subject to Degradable Links, A. Nagurney and Q. Qiang, *Europhysics Letters* (2007), **80**, 68001, p1-p6.

A Network Efficiency Measure for Congested Networks, A. Nagurney and Q. Qiang, *Europhysics Letters* (2007), **79**, 38005, p1-p5.

The Internet, Evolutionary Variational Inequalities, and the Time-Dependent Braess Paradox, A. Nagurney, D. Parkes, and P. Daniele, *Computational Management Science* (2007), **4**, pp. 355-375.

The Co-Evolution and Emergence of Integrated International Financial Networks and Social Networks: Theory, Analysis, and Computations, A. Nagurney, J. M. Cruz, and T. Wakolbinger, in *Globalization and Regional Economic Modelling*, R. Cooper, K. P. Donaghy, and G. J. D. Hewings, Editors, Springer, Berlin, Germany (2007), pp. 183-226.

Dynamic Electric Power Supply Chains and Transportation Networks: An Evolutionary Variational Inequality Formulation, A. Nagurney, Z. Liu, M.-G. Cojocaru, and P. Daniele *Transportation Research E* (2007), **43**, pp. 624-646.

Financial Networks with Intermediation and Transportation Network Equilibria: A Supernetwork Equivalence and Reinterpretation of the Equilibrium Conditions with Computations, Z. Liu and A. Nagurney, *Computational Management Science* (2007), **4**, pp. 243-281.

Projected Dynamical Systems, Evolutionary Variational Inequalities, Applications, and a Computational Procedure, M.-G. Cojocaru, P. Daniele, and A. Nagurney, in *Pareto Optimality, Game Theory, and Equilibria*, A. Chinchuluun, A. Migdalas, P. M. Pardalos, and L. Pitsoulis, Editors, Springer, Berlin, Germany (2007), pp. 169-188.

Statics and Dynamics of Global Supply Chain Networks with Environmental Decision-Making, A. Nagurney, J. Cruz, and F. Toyasaki, in *Pareto Optimality, Game Theory, and Equilibria*, A. Chinchuluun, A. Migdalas, P. M. Pardalos, and L. Pitsoulis, editors, Springer, Berlin, Germany (2007), pp. 611-646.

An Evolutionary Variational Inequality Formulation of Supply Chain Networks with Time-Varying Demands, A. Nagurney and Z. Liu, in *Network Science, Nonlinear Science and Game Theory Applied to the Study of Infrastructure Systems*, T. L. Friesz, Editor, Springer, Berlin, Germany (2007), pp. 267-302.

A Network Efficiency Measure with Application to Critical Infrastructure Networks, A. Nagurney and Q. Qiang (2007), *Journal of Global Optimization*, in press.

An Efficiency Measure for Dynamic Networks with Application to the Internet and Vulnerability Analysis, A. Nagurney and Q. Qiang (2007).

An Integrated Electric Power Supply Chain and Fuel Market Network Framework: Theoretical Modeling with Empirical Analysis for New England, Z. Liu and A. Nagurney (2007).

Happy New 2008 Year!



The Center Director, Professor Anna Nagurney, the Center Associates, and the UMass Amherst INFORMS Student Chapter wish everyone a wonderful New Year!

Many thanks for your support in 2007!

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If you would like to be put on our email list, contact supernet@som.umass.edu

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