
The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Winter 2007



Welcome to the Winter 2007 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 an essay by Professor Anna Nagurney on her reflections on this past semester and diversity. We also have information on the Spring 2007 UMass Amherst INFORMS Speaker Series and on upcoming exciting conferences. In addition, we have highlights of the visits of Dr. Siokos from Citigroup in London and Professor Rothengatter from the University of Karlsruhe. As always, we also provide a list of our recent publications.

We wish everyone a wonderful 2007!

Anna Nagurney
John F. Smith Memorial Professor
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Professor Panos M. Pardalos of the University of Florida with Student Center Associates at the Radcliffe Exploratory Seminar on Dynamic Networks co-organized by Professor David Parkes of Harvard University and Center Director Anna Nagurney



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Reflections on an Amazing Semester and Diversity

Anna Nagurney

Having spent the 2005-2006 year as a Science Fellow at the Radcliffe Institute for Advanced Study at Harvard University while on sabbatical from the University of Massachusetts at Amherst; see http://www.radcliffe.edu/fellowships/nagurney_year/index.php I knew that returning back to Amherst after a truly extraordinary year with side trips to give invited talks in Iceland, Cyprus, Sicily, and China would take some adjustment. It was a year in which I made many new friends, had a new book, *Supply Chain Network Economics*, published by Edward Elgar Publishing, and realized how important it is to have an institute such as the Radcliffe Institute in which one can intensely work on one's project while celebrating different intellectual fields of endeavor in a mutually supportive community of scholars and creative artists. In addition, the Radcliffe Institute, formerly the Bunting Institute, is especially nurturing of female researchers and persons of color; see: <http://www.radcliffe.edu> I thank the Radcliffe Institute and especially Dean Drew Gilpin Faust, Dr. Judith Vichniac, the Director of the Fellowship Program, Dr. Barbara Grosz, the Dean of Science, as well as the Executive Dean, Dr. Louise Richardson, for their terrific leadership of the Radcliffe Institute and its programs. The strength and sustenance that I garnered from my year at Radcliffe continue to support me as do the memories. Throughout the magical year at Radcliffe, my doctoral students would come to visit me in Cambridge and I would also head back to Amherst to help them with their dissertations and to support the UMass Amherst INFORMS (Institute for Operations Research and the Management Sciences) Student Chapter, as its Faculty Advisor, in its activities and its Speaker Series; see: <http://student.som.umass.edu/informs/>

As we enter the cusp of a New Year - 2007 - I would like to share some of my reflections on the Fall 2006 semester, one which, I believe, has kept the special spirit of my Radcliffe Fellowship Year alive. Through the UMass Amherst INFORMS Student Chapter in the Fall 2006 semester we have brought such outstanding researchers and practitioners to the Isenberg School of Management as Dr. Robin Lougee-Heimer of IBM, Professor Cynthia Barnhart of MIT (the President-Elect of INFORMS), Professor William Hogan of the Kennedy School of Government at Harvard, Dr. Les Servi of MIT/Lincoln Labs, and an INFORMS Fellow, Professor Andrew McCallum of the Computer Science Department at UMass Amherst, and Professor Nathaniel Whitaker of the Department of Mathematics and Statistics at UMass Amherst (see <http://supernet.som.umass.edu/informs/speakernew.html>) who on December 8, 2006 was awarded the Public Service Award from UMass President Jack Wilson for his work in developing programs to support mathematics education for minorities. This incredible group of speakers and individuals took the time out of their very busy schedules to come to the Isenberg School of Management at UMass Amherst, and gave brilliant presentations, answering numerous questions from the audience. They also met with students and interested guests to discuss their research and projects in greater depth. Their presence, energy, intellectual scholarship, leadership, and humanity inspired all those in attendance and helped to celebrate diversity and achievement, coupled with passion for one's work.

Diversity was also a theme that rose to the fore for me this past term, since in the summer of 2006 I was appointed by the President of INFORMS, Professor Mark S. Daskin of Northwestern University, to chair the INFORMS Ad Hoc Committee on Diversity. INFORMS is a professional society with close to 11,000

members internationally; see: <http://informs.org> The report, compiled over a 4 month intense period of study, with support by INFORMS, and which contains preliminary findings, was presented to the INFORMS Board at the Annual INFORMS Meeting held in Pittsburgh, PA, November 5-8, 2006. The report and the presentation are at: <http://supernet.som.umass.edu/informs-diversity/informs-diversity-committee.html>

In the report, the committee made use of the findings and research of, among others, Dean Barbara Grosz of the Radcliffe Institute for Advanced Study, Professor Donna J. Nelson of the University of Oklahoma, and Dr. Donna Shalala, the President of the University of Miami.

Most importantly, I personally thank Professor Mark S. Daskin for taking the initiative to examine INFORMS as to diversity. This type of leadership is to be commended. I look forward to further discussions regarding the findings in the report.

Spring 2007 UMass Amherst INFORMS Student Chapter Speaker Series

The UMASS Amherst INFORMS (Institute for Operations Research and the Management Sciences; <http://www.informs.org>) Student Chapter is delighted and honored to announce the Operations Research/Management Science Spring 2007 Speaker Series. This is the sixth semester of this speaker series, which brings speakers to the Isenberg School of Management each semester. The talks take place on scheduled Fridays at 11AM in the Isenberg School of Management (ISOM), Room 112, and are open to the public.

Confirmed speakers for Spring 2007 and the dates of their presentations are:

Professor Asu Ozdaglar of MIT, February 23, 2007,

Professor Richard Larson of MIT, March 8, 2007,

Professor David Parkes of Harvard, April 13, 2007, and

Professor Karen E. Polenske of MIT, April 27, 2007.

Those interested in attending can view the following link for more information on the speakers, the titles of the presentations, and the abstracts:

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

The UMass Amherst Speaker Series Coordinator for 2006-2007 is Doctoral Student Center Associate Trisha Woolley. The Faculty Advisor is Center Director, Professor Anna Nagurney.

The various activities of the student chapter, including presentations of seminar speakers and <http://student.som.umass.edu/informs/>

The Radcliffe Exploratory Seminar on Dynamic Networks: Behavior, Optimization and Design - A Big Success

Professor David Parkes, the John L. Loeb Associate Professor of Natural Sciences and Associate Professor of Computer Science in the Division of Engineering and Applied Sciences at Harvard University and Center Director, Professor Anna Nagurney, co-organized the Radcliffe Exploratory Seminar on Dynamic Networks: Behavior, Optimization, and Design at the Radcliffe Institute for Advanced Study in Cambridge, Massachusetts, October 20-21, 2006. The exploratory seminar, which was funded by the Radcliffe Institute for Advanced Study at Harvard University was a big success. It brought together such notable researchers as Professors Mark Newman of the University of Michigan, Michael Mitzenmacher of Harvard, John Byers of Boston University, David Alderson of the Naval Postgraduate School, Panos Pardalos of the University of Florida, Lada Adamic of the University of Michigan, Patrick Wolfe of Harvard, David Levinson of the University of Minnesota, William Sandholm of the University of Wisconsin, Asu Ozdaglar of MIT, and Joan Feigenbaum of Yale University.

Several doctoral students from UMass Amherst as well as from Harvard also attended the seminar and participated in the very lively and stimulating discussions. It was terrific to see computer scientists, operations researchers /management scientists, engineers, physicists, as well as an economist and applied mathematicians and statisticians discussing dynamic networks in such a warm and intellectually stimulating workshop!



Dean Barbara Grosz opens up the Radcliffe Exploratory Seminar on Dynamic Networks -- Professors Parkes and Mitzenmacher, seated

The Radcliffe Institute did an outstanding job of organizing the logistics for the speakers, including the lunches and wonderful dinner. As one participant said, "it is amazing as to what can be accomplished when the right people are brought together!"

The co-organizers thank all those involved for such a special exploratory workshop that truly engaged researchers from multiple disciplines! Special thanks to the Radcliffe Institute for Advanced Study at Harvard University for initiating and supporting such exploratory seminars.

The presentations of the speakers, along with relevant papers, can be found at: <http://www.eecs.harvard.edu/~parkes/RadcliffeSeminar.htm> Additional photos are at: <http://supernet.som.umass.edu/radcliffe-seminar/seminar-photos.htm>

Kudos, Congratulations, and News

Congratulations to Doctoral Student Center Associate Tina Wakolbinger, who on November 7, 2006 at the 2006 Annual INFORMS Meeting in Pittsburgh, PA, received the Judith Liebman Award for her work with the UMass Amherst INFORMS Student Chapter! Tina was recognized for her work in revitalizing the chapter and in serving as the Speaker Series Coordinator for 2004-2005 and 2005-2006. She also served as the Chapter's President in 2004-2005.

More information on the Judith Liebman Award can be found at: <http://www.informs.org/Prizes/whoisLiebman.html>

At the INFORMS Annual Meeting in November 2005, held in San Francisco, Tina Wakolbinger had an opportunity to meet Dr. Judith Liebman during the awards breakfast in which Professor Nagurney received the 2005 Moving Spirit Award for her work with the Student Chapter.



Tina Wakolbinger with her Judith Liebman Award plaque at the INFORMS in Pittsburgh with Student Center Associate Trisha Woolley and Professor Anna Nagurney



Professor Anna Nagurney and Center Associate, Professor June Dong, with Professor Daoli Zhu of Fudan University in Shanghai, China

Congratulations to Dr. Daoli Zhu, the Chair of the Department of Management Science at Fudan University, who in October, 2006 received the Fudan Premium Fund Prize in Management. The prize is valued at 350,000 yuan (approximately \$43,500US). The prize was established to promote outstanding research and practice in management. This year the focus of the award was on contributions to Management Science. Dr. Zhu is a Friend of the Virtual Center for Supernetworks and both Center Associates Professors June Dong and Ding Zhang have worked with Dr. Zhu. Professor Anna Nagurney served on the prize committee in Shanghai, China in August 2006 and was one of only three "Westerners" to be invited to serve on the twelve member selection committee. Professor Charles Corbett of UCLA and Professor Jean-Pierre Benghozi of Ecole Polytechnique in Paris, France also served on the prize committee. For more information, see: <http://supernet.som.umass.edu/media/loop081006.htm#Zhu>

Additional photos of Shanghai, China are at: <http://supernet.som.umass.edu/photos/Fudan-2006/fudanphotos2006.htm>

On December 7, 2006, Professor Anna Nagurney gave a seminar at the Department of Civil and Environmental Engineering at UMass Amherst. The title of her seminar was: "Transportation Science and the Dynamics of Critical Infrastructure Networks." She very much enjoyed the interactions with the faculty and students in the audience and was hosted by Professor John Collura, the head of the Transportation Engineering Program. She was accompanied by Patrick Qiang, who is a Doctoral Student Center Associate and who is conducting research with Professor Nagurney on the topic of the seminar.

The Virtual Center for Supernetworks is supporting the UMass Amherst initiative on advanced energy, due to its research on sustainable transportation and supply chains, and had its research activities recently featured at a conference in Boston. The Center is listed on the following new energy research-focused website:

<http://www.umass.edu/research/energy/index.html>

On March 3, 2007, Professor Nagurney will take part in the Brown University Symposium for Undergraduates in the Mathematical Sciences (SUMS) in Providence, Rhode Island. She is an invited speaker and this year's theme is Operations Research. More information is at: <http://www.math.brown.edu/SUMS/index.php?page=details>

For presentations of the Center Director and Associates at a variety of forums, see: <http://supernet.som.umass.edu/visuals.html>

Dr. Stavros Siokos of Citigroup Visits the Center

On November 29 - 30, 2006, Dr. Stavros Siokos, the Managing Director of Citigroup in London, England, and a Center Associate, visited the Center and the Isenberg School of Management. On the evening of November 29, he joined Anna Nagurney at the first annual UMass Amherst dinner to honor Fulbrighters. The Dean of the Graduate School, Dr. John Mullin, hosted the dinner. Professor Nagurney held a Distinguished Chaired Fulbright in Innsbruck, Austria from March - July 2002. On November 30, Dr. Siokos was hosted at a reception at the Supernetworks Lab at the Isenberg School and then gave a seminar entitled, "New Trends in Financial Engineering - A Sell Side Perspective." Dr. Siokos answered numerous questions from the audience and we especially appreciated the time that he took out of his extremely busy schedule to come visit his alma mater. Dr. Siokos received his PhD from UMass in 1998 and he is the co-author with Professor Nagurney of the

book, *Financial Networks: Statics and Dynamics*, published by Springer Verlag in 1997.

Dr. Siokos' presentation as well as the press release of his visit are available at: <http://supernet.som.umass.edu/visuals.html>

More information on Dr. Siokos is available on his Virtual Center for Supernetworks page: <http://supernet.som.umass.edu/associates/ssiokos.htm>



Dr. Siokos talking with Former Dean, Dr. Tom O'Brien, at the reception

For additional photos of Dr. Siokos' visit as well as photos of other center activities, see: <http://supernet.som.umass.edu/cfoto/centerphotos.html>

Exciting Upcoming Conferences

Geneva, Switzerland - Venue of the Upcoming Computational Management Science Conference



The Center Director, Professor Anna Nagurney, and Associates will be presenting at several forthcoming conferences. Professor Nagurney is on the organizing committee of both the

Computational Management Science and the Computing in Economics and Finance Conferences. For more information on the conferences below, see:

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

Supply Chain And Logistics Engineering (SCALE) Conference, Gainesville, Florida, February 16-17, 2007,

The Second International Conference on Complementarity, Duality, and Global Optimization in Science and Engineering (CDGO-2007) Gainesville, Florida, February 28 - March 2, 2007,

4th International Conference on Computational Management Science, Geneva, Switzerland, April 20-22, 2007,

18th Annual Conference of the Production and Operations Management Society, Dallas, Texas, May 4 -7, 2007,

7th Meeting on Game Theory and Practice Dedicated to Energy, Environment and Natural Resources, Montréal, Canada, May 28 - 30, 2007,

13th International Conference on Computing in Economics and Finance, Montreal, Canada, June 14-16, 2007,

World Conference on Transport Research 2007 Berkeley, California, June 24-28, 2007, and

INFORMS International Meeting 2007, Puerto Rico, July 8-11, 2007.

Recent Center Publications

Copies of these (and other) center articles may be found at:

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

A Supply Chain Network Perspective for Electric Power Generation, Supply, Transmission, and Consumption, A. Nagurney and D. Matsypura, in *Optimisation, Econometric and Financial Analysis*, E. J. Kontoghiorghes and C. Gatu, Editors, Springer, Berlin, Germany (2006), pp. 3-27.

Dynamics of Supply Chain Networks with Corporate Social Responsibility through Integrated Environmental Decision-making. J. M. Cruz, (2006), to appear in *European Journal of Operational Research*.

Networks in Finance, A. Nagurney, to appear in *Handbook on Information Technology and Finance*, D. Seese, C. Weinhardt, and F.

Schlottman, Editors, Springer, Berlin, Germany (2007).

Sustainable Supply Chain and Transportation Networks, A. Nagurney, Z. Liu, and T. Woolley, *International Journal of Sustainable Transportation* (2007), **1**, in press.

The Internet, Evolutionary Variational Inequalities, and the Time-Dependent Braess Paradox, A. Nagurney, D. Parkes, and P. Daniele, *Computational Management Science* (2006), in press; published online by Springer, September 12, 2006.

Financial Engineering of the Integration of Global Supply Chain Networks and Social Networks with Risk Management, J. Cruz, A. Nagurney, and T. Wakolbinger, *Naval Research Logistics* (2006), **53**, 674-696.

Optimal Endogenous Carbon Taxes for Electric Power Supply Chains with Power Plants, A. Nagurney, Z. Liu, and T. Woolley, *Mathematical and Computer Modelling* (2006), **44**, 899-916.

Dynamic Electric Power Supply Chains and Transportation Networks: An Evolutionary Variational Inequality Formulation, A. Nagurney, Z. Liu, M.-G. Cojocaru, and P. Daniele (2005), *Transportation Research E*, in press.

Financial Networks with Intermediation and Transportation Network Equilibria: A Supernetwork Equivalence and Reinterpretation of the Equilibrium Conditions with Computations, Z. Liu and A. Nagurney (2006), *Computational Management Science*, in press; published online by Springer, June 27, 2006.

Modeling of Electric Power Supply Chain Networks with Fuel Suppliers via Variational Inequalities, D. Matsypura, A. Nagurney, and Z. Liu, submitted (2006).

Spatially Differentiated Trade of Permits for Multipollutant Electric Power Supply Chains, T. Woolley, A. Nagurney, and J. K. Stranlund, submitted (2006).

Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium Reformulation, Z. Liu and A. Nagurney, submitted (2006).

For an invited Op Ed piece on electric power supply chains, written by Professor Anna Nagurney, entitled, "Meeting the Region's Energy Needs," and published in the *Daily Hampshire Gazette* in November 2006, see: <http://supernet.som.umass.edu/commentary/Opinion-gazette110806.html>

Professor Rothengatter's Visit

Professor Werner Rothengatter of the University of Karlsruhe, Germany with Doctoral Student Center Associates in front of the Fine Arts Building at UMass Amherst



In the Fall of 2006, the Center Director and the Doctoral Student Associates were delighted to participate in the hosting of Professor Rothengatter as part of the University of Massachusetts Exchange Program with universities in Germany. This project was funded by the President's Office with a Grant in Science and Technology to the International Program's Office at UMass Amherst, under the Directorship of Professor Frank Hugus. Professor Werner Rothengatter is an expert on transportation and the management of infrastructure projects.

The presentations of research conducted by the doctoral students and delivered to Professor Rothengatter in a mini-workshop forum during his visit to the Supernetworks Lab can be found at:

<http://supernet.som.umass.edu/visuals/rothengatter-presentations.pdf>

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