
The Supernetwork Sentinel

The Newsletter of the Virtual Center for Supernetworks

Fall 2010



Welcome to the Fall 2010 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 highlight our recent international activities in Argentina, China, Austria, and Ukraine. We also share news about accolades received by the Center Associates, their activities, and noteworthy upcoming events. As always, we include a list of our recent Center publications.

Anna Nagurney
John F. Smith Memorial Professor
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Professor Anna Nagurney with colleagues at the 2010 CMS Conference in Vienna, Austria



Dr. Patrick Qiang and Dr. June Dong in Shanghai, China

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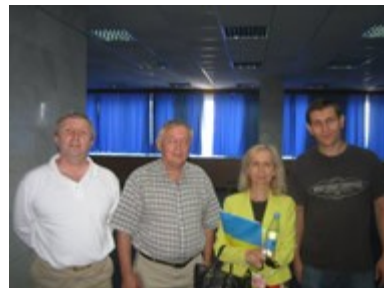
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Recent Center Publications



(l-r) Drs. Gorbachuk, Yatsenko, Nagurney, and Butenko at the Yalta Conference

ALIO-INFORMS Conference in Buenos Aires, Argentina a Big Success



Dr. Anna Nagurney giving her plenary talk



The WORMS panel on International Collaborations



Dr. Nagurney after her paper presentation

The ALIO-INFORMS Conference took place June 6-9, 2010, in Buenos Aires, Argentina, where Center Director Professor Anna Nagurney delivered an invited tutorial, *Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age*. Her presentation [slides are available](#). An invited paper, based on this

tutorial, and in press in the journal, *International Transactions in Operational Research*, joint with Center Associate Professor Patrick Qiang, her co-author of the *Fragile Networks* book, [can be downloaded \(in pdf format\)](#).

At the conference, she also served on the panel, *International Collaborations*, sponsored by Women in Operations Research and the Management Sciences (WORMS). Moderated by Dr. Sadan Kulturel-Konak of Penn State Berks, the panel also included Dr. Gulnara Baldoquin, Instituto Politécnico José Antonio Echeverría, Cuba; Dr. Karla Hoffman, George Mason University; and Dr. Lorena Predanas, Universidad de Concepción, Chile. Professor Nagurney thanks Professor Kulturel-Konak for this wonderful opportunity.

In addition, at this conference, Professor Anna Nagurney also presented the paper, **Sustainable Supply Chain Network Design: A Multicriteria Perspective**, joint with Center Associate Professor Ladimer S. Nagurney.

Center Associates Advance Supernetworks in China



Announcement of Dr. Qiang's presentation

Center Associate Professor Patrick Qiang delivered the presentation, **Vulnerability of Fragile Networks**, at the School of Management at the Shanghai University for Science and Technology in China and was hosted by Center Associate Professor June Dong of SUNY Oswego. We include photos taken with his host, a group photo with the audience, and an announcement on the university home page, which Student Associate Min Yu helped to translate. The audience for Dr. Qiang's talk included students of [Professor Daoli Zhu, who received the Fudan Management Science prize in 2006](#).



Drs. Qiang and Dong with the audience

While in China, Dr. Qiang also delivered the paper, **System-Optimized Transportation Network with Disruption Hedging Investment**, at the 2010 IEEE Conference on Advanced Management Science in Chengdu, July 9-11.

2010 CMS Conference in Vienna, Austria

The [2010 Computational Management Science \(CMS\) conference](#) took place July 28-30, in Vienna, Austria. The conference was outstanding.



Photo taken at the session

Professor Anna Nagurney organized a session at this conference which featured Center Associate Professor Tina Wakolbinger of the University of Memphis, who spoke on her joint work with Professor Fuminori Toyasaki of York University. Her presentation was: **An Analysis of Impacts Associated with Earmarked Private Donations for Disaster Relief**. In the same session, Professor Anna Nagurney delivered the paper, **Supply Chain Network Design for Critical Needs with Outsourcing**, co-authored with Student Center Associate Min Yu and

Professor Patrick Qiang. These as well as other presentations are available at: <http://supernet.som.umass.edu/visuals.html>

Professor Anna Nagurney's plenary talk, **Supply Chain Networks: Challenges and Opportunities from Analysis to Design**, [can be accessed, in pdf format, here](#).



A social get-together at the CMS conference

We thank Professor Georg Pflug of the University of Vienna, who was the organizer of the 2010 CMS conference, for the wonderful scientific exchanges and memories!

Yalta Optimization Conference on Network Science in Ukraine

Following the CMS Conference in Vienna, Austria, Professor Anna Nagurney flew to Yalta, Ukraine, via Kiev, to take part in the Third Yalta Conference on Optimization with the theme of *Network Science*.

This conference was held from August 2-4, 2010 at the Yalta Hotel. The conference opened with a keynote presentation by Professor Nagurney, *Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain World*, the title of her latest book, co-authored with Professor Patrick Qiang, and published in 2009 by John Wiley & Sons. Another keynote speaker was Professor Yaroslav Sergeyev of the University of Calabria in Italy and the N. I. Lobachevsky State University of Nizhni Novgorod, Russia who spoke on *Lipschitz Global Optimization Algorithms*.

The conference included presentations focusing on the methodological aspects of network problems from transportation and logistics applications to biological and medical ones. Among the notable talks was a presentation by Dr. Vitaliy Yatsenko of the Space Research Institute of the National Academy of Sciences of Ukraine, who spoke on sensor networks and weather in outer space with risk assessment. Speakers and conference participants came from

the US, Ukraine, Romania, Italy, Sweden, and Russia.

In addition, undergraduate and graduate students from US universities who were participants in the International Research Experience for Students (IRES) Workshop on Discrete and Nondifferentiable Optimization: Algorithms and Applications, funded by the US National Science Foundation (NSF), which took place at the Glushkov Institute in Kyiv, July 20-August 10, 2010, also took part in the Yalta Conference. Several of the students, whose fields of study include: optimization, operations research, computer science, engineering, and statistics, also gave talks.

The conference was organized by Professors Sergiy Butenko of Texas A&M University, Oleg Prokopyev of the University of Pittsburgh, and Volodymyr P. Shylo of the Glushkov Institute of Cybernetics of the National Academy of Sciences, Kyiv, Ukraine. Funding for the conference was provided by the US NSF, with technical support from the Glushkov Institute of Cybernetics, Texas A&M University's Department of Industrial and Systems Engineering, and the University of Pittsburgh's Department of Industrial Engineering.

In addition to the scientific presentations and discussions, the conference also included a social program with a banquet.

The conference program with the titles and abstracts of the presentations can be accessed at: <http://www.yalta.conference.info>

Professor Anna Nagurney thanks the organizers of this conference for their wonderful hospitality and attention to detail!



The Yalta Conference participants



View of the Black Sea from the Yalta Hotel, the venue for the Optimization Conference

Kudos and News

The Center Director and Associates welcome Mr. Nathan Kollett as a new Student Center Associate. Nathan has matriculated into the doctoral program in Management Science at the Isenberg School. He holds a BA degree from UMass Amherst with a major in Economics and a minor in Mathematics. For the past two years, he worked as a mutual fund accountant and business analyst at State Street Corporation in Boston, MA.

Kudos to Center Associate Professor Jose M. Cruz of the School of Business at the University of Connecticut who has had several papers accepted recently for publication, including, **Match-Size Based Rearrangement of the Shop Floor into Mini-Lines**, joint with M. Nunez, which is forthcoming in the *International Journal of Production Research* and **Supply Chain Disruption Risk Management Through Strategic Information Acquisition and Sharing and Risk Sharing Contracts**, joint with Center Associate Professor Tina Wakolbinger, which is forthcoming in the *International Journal of Production Research*.

Professor Cruz took part in the Euro XXIV Conference, in Lisbon, Portugal, July 11-14, 2010, where he delivered two papers: **Closed Loop Supply Chains: A Systems Dynamics Model for Analyzing Sustainable Business Policies for Shared Partners in a Chain**, with S. Battacharjee and H. Singh, and **Mitigating Global Supply Chain Risk Through Corporate Social Responsibility**. The latter talk he delivered in a session organized by Center Associate Professor Patrizia Daniele of the University of Catania in Italy.

Congratulations to Center Associate Professor Lan Zhao of SUNY at Old Westbury. Her article, **Optimization of Integrated Procedure of Internet Marketing**, appears in the

Encyclopedia of E-Business Development and Management in the Digital Economy (2010), Hershey, New York. Also, her paper, joint with J. Zhu, **Internet Marketing Budget Allocation-From Practitioners' Perspective**, was published in the *International Journal of Information Technology and Decision Making*.

Center Associate Professor Ladimer S. Nagurney had his paper, co-authored with the Center Director, entitled: **Sustainable Supply Chain Network Design: A Multicriteria Perspective**, published in the *International Journal of Sustainable Engineering* (2010), **3**, 189-197. On August 30, 2010, he spoke on **E-Cycling**, as part of the University of Hartford's student orientation *Our Campus, Our Planet*.

Congratulations to Center Associates Professors Trisha Woolley of Texas Wesleyan University and Patrick Qiang on the publication of their paper, **Multiproduct Supply Chain Horizontal Network Integration: Models, Theory, and Computational Results**, with Anna Nagurney, in the *International Transactions in Operational Research* (2010), **17**, 333-349.

Center Associate Professor Patrizia Daniele is a member of the organizing committee of the Fifth China-Italy Colloquium on Applied Mathematics, September 27-30, 2010. She is also the co-organizer of the session, *Variational Inequality Problems and Equilibrium Problems*, for the 41st Annual Conference AIRO in the Villa San Giovanni, September 7-10, 2010. Kudos to Professor Daniele for the publication of her paper, **Evolutionary Variational Inequalities and Applications to Complex, Multi-level Models**, in *Transportation Research E* (2010), **46**, 855-880.

Congratulations to Center Associate Professor Dmytro Matsypura of the University of Sydney in Australia for the acceptance of his paper, **Strategy vs. Risk in Margining Portfolios of Options**, co-authored with Professors E. G. Coffman Jr. and V. G. Timkovsky, in the journal *4OR: A Quarterly Journal of Operations Research*.

Center Director Anna Nagurney received an award plaque as part of the 2010 Ernst & Young Inclusive Excellence Award for Accounting and Business School Faculty for her role in promoting diversity and inclusiveness.

Center Associates will be taking part in the annual INFORMS Conference to be held in Austin, Texas, November 7-10, 2010. Dr. Jose Cruz is chairing a session on *Sustainable and Responsible Supply Chain Management*, in which Center Associates Professors Trisha Woolley, Zugang Liu of Penn State Hazleton, and Cruz have a joint paper, as well as Professors Woolley and Anna Nagurney. Dr. Tina Wakolbinger is chairing the session *Decision-Making in*

Nonprofit Organizations in which she has a co-authored paper with Professor Frances Fabian and Nagurney has a joint paper with Min Yu and Professor Qiang. Center Associate Professor Dmytro Matsypura will be speaking on his work with Professor Timkovsky in a session on *Financial Engineering*.

In addition, the Center Director is serving on the program committee as the tutorial chair for the 2011 SBP Conference to be held at the University of Maryland in College Park, March 29-April 1.

Student Center Associate Amir Masoumi will be teaching a required course, *Introduction to Management Science*, for operations management majors at the Isenberg School in the Fall 2010 while Nathan Kollett and Min Yu serve as teaching assistants for Professor Anna Nagurney's undergraduate course in *Transportation & Logistics*.

For information on these and other upcoming conferences, please [click on this link](#).

Recent Center Publications

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

Sustainable Supply Chain Network Design: A Multicriteria Perspective, A. Nagurney and L. S. Nagurney, *International Journal of Sustainable Engineering* (2010), **3**, 189-197.

An Integrated Framework for the Design of Optimal Web Banners, L. Hai, L. Zhao, and A. Nagurney, *Netnomics* (2010), **11**, 69-83.

Multiproduct Supply Chain Horizontal Network Integration: Models, Theory, and Computational Results, A. Nagurney, T. Woolley, and Q. Qiang, *International Transactions in Operational Research* (2010), **17**, 333-349.

Supply Chain Network Design Under Profit Maximization and Oligopolistic Competition, A. Nagurney, *Transportation Research E* (2010), **46**, 281-294.

Environmental Impact Assessment of Transportation Networks with Degradable Links in an Era of Climate Change, A. Nagurney, Q. Qiang, and L. S. Nagurney, *International Journal of Sustainable Transportation* (2010), **4**, 154-171.

Supply Chain Network Design for Critical Needs with Outsourcing, A. Nagurney, M. Yu,

and Q. Qiang, *Papers in Regional Science* (2010), in press.

Formulation and Analysis of Horizontal Mergers Among Oligopolistic Firms with Insights into the Merger Paradox: A Supply Chain Network Perspective, A. Nagurney, *Computational Management Science* (2010), in press.

The Negation of the Braess Paradox as Demand Increases: The Wisdom of Crowds in Transportation Networks, A. Nagurney, *Europhysics Letters* (2010), in press.

Fragile Networks: Identifying Vulnerabilities and Synergies in an Uncertain Age, A. Nagurney and Q. Qiang (2010), to appear in the *International Transactions in Operational Research*.

Optimal Supply Chain Network Design and Redesign at Minimal Total Cost and Demand Satisfaction, A. Nagurney, *International Journal of Production Economics* (2010), in press.

Supply Chain Outsourcing Under Exchange Rate Risk and Competition, Z. Liu and A. Nagurney (2010), submitted.

Multiproduct Supply Chain Network Design with Applications to Healthcare, A. Nagurney, M. Yu, and Q. Qiang (2010), submitted.

A Bi-Criteria Measure to Assess Supply Chain Network Performance for Critical Needs Under Capacity and Demand Disruptions, Q. Qiang and A. Nagurney (2010), submitted.

Multiperiod Competitive Supply Chain Networks with Inventorying and a Transportation Network Equilibrium Reformulation, Z. Liu and A. Nagurney (2010), submitted.

Fashion Supply Chain Management Through Cost and Time Minimization from a Network Perspective, A. Nagurney and M. Yu (2010), submitted.

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

Center Director

Dr. Anna Nagurney
John F. Smith Memorial Professor

Center Associates

Dr. Jose M. Cruz
Dr. Patrizia Daniele
Dr. June Dong
Dr. Ke "Grace" Ke
Dr. Zegang "Leo" Liu
Dr. Dmytro Matsypura
Dr. Ladimer S. Nagurney
Dr. Qiang "Patrick" Qiang
Dr. Padma Ramanujam
Dr. Stavros Siokos
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Dr. Trisha Woolley
Dr. Ding Zhang
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