

The Supernetwork Sentinel

Fall 2023

Welcome to the Fall 2023 edition of **The Supernetwork Sentinel**, the newsletter of the Virtual Center for Supernetworks at the Isenberg School of Management, UMass Amherst. We are now publishing this newsletter in Fall and Spring editions. The newsletter's purpose is to keep you informed of events, activities, and successes of the Virtual Center for Supernetworks and the Center Associates. In this newsletter, we share with our readers and supporters the achievements of the Center Director and Center Associates as well as Center activities. As always, we include Kudos and News and a list of our recent Center publications.



Center Associates: Dana Hassani and Professors Deniz Besik and Pritha Dutta at 2023 DSI Annual Conference in Atlanta, GA

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Professor Anna Nagurney being introduced by Stanford Professor Margaret Brandeau prior to her IFORS keynote talk in Santiago

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Dynamics of Disasters Conference in Piraeus, Greece

The Center Director Professor Anna Nagurney would like to thank all those who took part in the 6th International Conference on Dynamics of Disasters, which took place in Piraeus, Greece, July 3-6, 2023.

The below collage was constructed to capture a few of the highlights.



It was inspiring to see conferees representing many different countries including: Austria, Germany, Nepal, Japan, Canada, Greece, Italy, Turkey, the UK, and the US.

In a period in history with compounding disasters, the exchange of knowledge and best practices and working together to address the great challenges that we are faced with are needed more than ever.

The plenary speakers were outstanding. Many thanks to them for the participation. The Center Director was honored to co-organize and yet another Dynamics of Disasters Conference with Professors Ilias S. Kotsireas of Wilfrid University and Panos M. Pardalos of the University of Florida.



The Center Director had the pleasure of presenting work done with her PhD student at the Isenberg School of Management, Doctoral Student Center Associate Dana Hassani, and colleagues at the Kyiv School of Economics: Professor Oleg Nivievskiy and Dr. Pavlo Martyshev. [The link to the slidedeck of the presentation can be accessed here.](#)

Not everyone could join us because of visa and other extenuating circumstances. Sadly, in April, Professor Urmila Pyakurel of Nepal passed away. She was an avid participant in our previous Dynamics of Disasters conferences. We paid a tribute to her in Piraeus. Urmila lost her life to cancer, which she had battled for many years. She was also a Humboldtian. [You can read about some aspects of her amazing life here.](#)

Center Director Keynotes IFORS Conference in Santiago

Professor Anna Nagurney had the great honor of keynoting the 2023 IFORS Conference, which is a triennial conference. It took place in Santiago, Chile, July 10-14. The conference took place shortly after the Dynamics of Disasters conference and between the two, she had the great pleasure of seeing Center Associate Professor Patrizia Daniele and her family in Madrid, Spain!



The Center Director was excited to see her book, **Labor and Supply Chain Networks**, displayed at the Springer booth at the conference, and to see many Operations Research colleagues from around the globe. Here previous time in Santiago was in January 2019, when she was invited to speak at the Congreso Futuro. It was fascinating to be back. Many thanks to Professor Alice Smith of Auburn University for the invitation to deliver the keynote, which focused on agricultural supply chains and disruptions on them by Russia's war on Ukraine.

ODS Conference in Ischia

The Optimization and Decision Sciences (ODS) Conference took place in early September 2023 in beautiful Ischia, Italy. Center Associate Professor Patrizia Daniele of the University of Catania was on the Program Committee.



Along with Center Associate Dr. Gabriella Colajanni, also of the University of Catania, our latest work on UAVs was presented at this conference. And, amazingly, we did the galley for the paper on which our presentation was based on a Tuesday and the presentation took place on Wednesday, and our paper, **Centralized Supply Chain Network Optimization with UAV-based Last Mile Deliveries**, was published in the journal *Transportation Research C on the next day!* The paper is open access and [can be viewed here](#). The results therein demonstrate

how a hybrid fleet can enhance profits and also reduce air pollution.



Professor Patrizia Daniele and Dr. Gabriela Collajani in the foreground

KSE Exchange Students at UMass Amherst

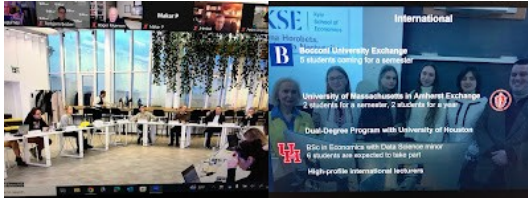
The Center Director continues to serve as a Co-Chair of the Board of Directors of the Kyiv School of Economics (KSE) in Ukraine. In addition, a partnership between UMass Amherst and KSE was established through a series of memoranda starting in March 2022, shortly after the full-scale invasion. The partnership provided fellowships for 15 Virtual Scholars working in Ukraine and Professor Anna Nagurney was honored to be a Faculty Host for 4 of them. In addition, as part of the partnership, a student exchange program was initiated through the great efforts of the International Programs Office and its Director, Vice Chancellor for Global Affairs Kalpen Trivedi.



In the Fall 2023 semester, there were 4 students from Ukraine studying at UMass Amherst. It was a delight to have these outstanding ambassadors for Ukraine in our midst. Thanks to the UMass Amherst INFORMS Student Chapter for organizing a panel featuring them at the Isenberg School, which also had excellent media coverage. Thanks also to Dr. Bogdan Prokopovych for assistance with the panel moderation!

[A followup interview with them is now posted on the Chapter's youtube channel.](#)

Professor Anna Nagurney took part virtually in a two day meeting with the Boards of the Kyiv School of Economics in November 2023 and also spoke about the partnership and the exchange students.



On December 11, 2023, Isenberg School Dean Anne P. Massey hosted a lunch in honor of the KSE exchange students and the Center Director also took part. The lunch was delicious and the company and conversations outstanding!

INFORMS Conference in Phoenix

It was truly extraordinary that this year's [INFORMS Annual Meeting](#) attracted over 6,000 delegates to Phoenix. The conference took place October 15-28, 2023 and convened operations researchers and analytics professionals from academia, practice and government. All continents except for Antarctica were represented and the INFORMS President Laura Albert remarked that, next year, perhaps even someone from that continent will join us.



To the Center Director, INFORMS is about the people/members, and she especially delighted in seeing several of Center Associates: Dmytro Matsypura of the University of Sydney in Australia, Deniz Besik of the University of Richmond, Shivani Shukla of the University of San Francisco and Sara Saberi at WPI and having one of her PhD students, Dana Hassani, present at his first such conference the paper that was co-authored with Kyiv School of Economics (KSE) colleagues in Ukraine. [It was published in the Journal of Global Optimization](#) as the lead article in an issue and was on display at the Springer booth in the Exhibit Hall. We got to keep the stunning *Journal of Global Optimization* issue. It was also very special to see both her [Labor and Supply Chain Networks](#) book, published in 2023, and the *Dynamics of Disasters* book that she co-edited with Ilias S. Kotsireas, Panos M. Pardalos and Arsenios Tsokas on display at the Springer booth. Lovely to chat with Professor Pardalos, his wife, and son in Phoenix!

Seeing many colleagues for the first time in person was also extra special since, in the pandemic, new connections were made virtually but only recently have the travel and the face to face exchanges become possible (and are so very welcome). The technical sessions and plenary and keynote talks were excellent and not all could be attended because quite a few took place "in parallel."

The Center Director enjoyed various board meetings, including that of the INFORMS Magazine Editorial Advisory Board with Kara Tucker and committee members at 8AM on Sunday morning, as well as the Editorial Board meeting of the *International Transactions in Operational Research* (ITOR), led by its Editor, Celso C. Ribeiro. The Editorial Board meeting of the *Journal of Global Optimization*, whose Editor is Sergiy Butenko, was also very enjoyable and the food was excellent - thank you, Springer, the publisher!

Upcoming Conferences

This spring, we are looking forward to the POMS conference, which will be in Minneapolis, Minnesota as well as the NEDSI conference in Cambridge, Massachusetts.

In June 2024, there will be an excellent conference in Halkidiki, Greece, celebrating the 70th birthday of Professor Panos M. Pardalos. Both Center Associate Professor Dmytro Matsypura and the Center Director are on the Program Committee. [For more information see the conference website.](#)

In late June, early July 2024, the EURO Conference will take place in Copenhagen, Denmark, and Center Associate Professor Tina Wakolbinger of the Vienna University of Economics and Business is on the Program Committee. [The website of the conference can be accessed here.](#)

Center Associate Professor Patrizia Daniele of the University of Catania is helping to organize the VINEPA Conference in Catania, which will take place in mid-July. The website is under construction.

[Relevant conferences are regularly updated on the Supernetwork Center website.](#)

Kudos and News

Congratulations to Doctoral Student Center Associate Dana Hassani. He received the inaugural publication award from the Operations and Information Management Department at the Isenberg School for his A-level journal article, **Multicommodity International Agricultural Trade Network Equilibrium: Competition for Limited Production and Transportation Capacity Under Disaster Scenarios with Implications for Food Security**, co-authored with A. Nagurney, O. Nivievskiy, and P. Martyshev. It is in press in the *European Journal of Operational Research*. The award comes with \$750. This is Dana's second journal article publication.

Congratulations to the UMass Amherst INFORMS Student Chapter for its receipt of the Magna Cum Laude Award from INFORMS at its Annual Meeting in Phoenix in October 2023. The Center Director continues to serve as the Faculty Advisor of the Student Chapter, which was established in 2004. Its first Chapter President was Tina Wakolbinger, who was a PhD student at the Isenberg School at that time.

A big congratulations to Center Associate Dong "Michelle" Li! In December 2023, she was informed that she was promoted to Associate Professor, with tenure, at Babson College in Wellesley, Massachusetts.

Center Associate Pritha Dutta has moved across the United States. She is no longer an Assistant Professor at Pace University in NYC but is now an Assistant Professor at Willamette University of Oregon. Professor Dutta, along with Center Associate Professor Deniz Besik and Doctoral Student Center Associate Dana Hassani presented papers at the 2023 DSI Annual Conference in Atlanta, Georgia, November 18-20, 2023.

Congratulations to Center Associates Gabriela Colajanni and Patrizia Daniele on the publication of their paper, **Centralized Supply Chain Network Optimization with UAV-based Last Mile Deliveries**, with the Center Director, in a special issue of the journal in 2023!

Recent Center Publications

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

Ukraine – Addressing the Domestic Humanitarian Crisis and the Effects of the War on Global Food Systems, O. Nivievskiy and A. Nagurney, in *Food and Humanitarian Crises: Science and Policies for Prevention and Mitigation Proceedings of the Working Group 9-10 May 2023*, Joachim von Braun, Bettina Iseli, Maximo Torero, Peter Turkson (Editors) Scripta Varia 154, LEV, Vatican City, 2024.

In Memoriam: Urmila Pyakurel (1980-2023), T.N. Dhamala and A. Nagurney, *Operations Research Forum* (2023), **4**, 93.

A Multicommodity Spatial Price Equilibrium Model with Exchange Rates and Non-Tariff Measures for Agri-Food International Trade, A. Nagurney and E. Besedina, *Operations Research Forum* (2023), **4**, 84.

Centralized Supply Chain Network Optimization with UAV-based Last Mile Deliveries, G. Colajanni, P. Daniele, and A. Nagurney, *Transportation Research C* (2023), **155**, 104316.

Multicommodity International Agricultural Trade Network Equilibrium: Competition for Limited Production and Transportation Capacity Under Disaster Scenarios with Implications for Food Security, A. Nagurney, D. Hassani, O. Nivievskiy, and P. Martyshev, *European Journal of Operational Research* (2023), in press.

Food Security and Multicommodity Agricultural International Trade: Quantifying Optimal Consumer Subsidies for Nutritional Needs, A. Nagurney, *International Transactions in Operational Research* (2023), in press.

Exchange Rates and Multicommodity International Trade: Insights from Spatial Price Equilibrium Modeling with Policy Instruments via Variational Inequalities, A. Nagurney, D. Hassani, O. Nivievskiy, and P. Martyshev, *Journal of Global Optimization* (2023), **87**, 1-30.

A Three-Stage Stochastic Optimization Model integrating 5G Technology and UAVs for Disaster Management, G. Colajanni, P. Daniele, A. Nagurney, L.S. Nagurney, and D. Sciacca, *Journal of Global Optimization* (2023), **86**, 741-780.

International Migrant Flows: Coalition Formation Among Countries and Social Welfare, M. Passacantando, F. Raciti, and A. Nagurney, *EURO Journal on Computational Optimization* (2023), **11**, 100062.

An Integrated Multitiered Supply Chain Network Model of Competing Agricultural Firms and Processing Firms: The Case of Fresh Produce and Quality, D. Besik, A. Nagurney, and P. Dutta, *European Journal of Operational Research* (2023), **307(1)**, 364-381.

A Bandwidth Auction Mechanism to Enable Affordable Internet Access, L.A. Marentes, S. Cabrales, T. Wolf, A. Nagurney, and Y. Donoso, *Netnomics* (2022), **22**, 283-316.

Supply Chain Networks, Wages, and Labor Productivity: Insights from Lagrange Analysis and Computations, A. Nagurney, *Journal of Global Optimization* (2022), **83**, 615-638.

Resilience of Supply Chain Networks to Labor Disruptions, A. Nagurney and A. Ermagun, *Resilience Findings* (2022), June 16.

Modeling of Covid-19 Trade Measures on Essential Products: A Multiproduct, Multicountry Spatial Price Equilibrium Framework, A. Nagurney, M. Salarpour, and J. Dong, *International Transactions in Operational Research* (2022), **29(1)**, 226-258.

Attracting International Migrant Labor: Investment Optimization to Alleviate Supply Chain Labor Shortages, A. Nagurney, *Operations Research Perspectives* (2022), **9**, 100233.

Defense Critical Supply Chain Networks and Risk Management with the Inclusion of Labor: Dynamics and Quantification of Performance and the Ranking of Nodes and Links, A. Nagurney (2022), accepted in: *Handbook for Management of Threats, Security and Defense, Resilience and Optimal Strategies*, K. Balomenos, A. Fytopoulos, and P.M. Pardalos, Editors, Springer Nature.

Optimization of Investments in Labor Productivity in Supply Chain Networks, A. Nagurney, *International Transactions in Operational Research* (2022), **29(4)**, 2116-2144.

Spatial Price Equilibrium Networks with Flow-Dependent Arc Multipliers, A. Nagurney and D. Besik, *Optimization Letters* (2022), **26**, 2483-2500.

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