

The Supernetwork Sentinel

Spring 2024

Welcome to the Spring 2024 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.



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Doctoral Student Center Associate Dana Hassani Receives the OIM Doctoral Student Exceptional Impact Award Scholarship



Boyer Lecturer Professor Chandra Bhat with Doctoral Student Center Associates Samira Samadi, Ismael Pour, and Dana Hassani plus Professor Mike Knodler

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Visit of KSE President Mylovanov

On February 12, 2024, we had the honor and pleasure of hosting Dr. Tymofiy Mylovanov, the President of the Kyiv School of Economics (KSE) in Ukraine, at the University of Massachusetts Amherst. This was his second visit to UMass Amherst - his first was on February 22, 2023.

His visit was very timely, as was his lecture, since we were then approaching the second anniversary of the full-scale invasion of Ukraine by Russia.

Mylovanov had sent Professor Anna Nagurney, the Center Director, a message just a few days before his arrival saying that he would like to visit and speak and, despite multiple logistical hurdles and scheduling issues, we made it work.

Leading a university is extremely challenging and leading one in wartime, with success, is extraordinary.

The Center Director has had the great honor of serving as a Co-Chair of the KSE of Board of Directors, having been elected shortly after the full-scale invasion. But her relationship with KSE has been over half a decade, since she also serves on its International Academic Board and its Board of Directors. Also, back in March 2022, UMass Amherst and KSE established a partnership, which has further synergized our connections, and is now supporting both exchange students from KSE as well as Virtual Scholars in Ukraine (we will be starting the second round soon) to reduce brain drain.

The leadership exhibited by KSE President Mylovanov is one characterized by: immense care for the safety of his students, faculty and staff; agility in creating new degree programs at KSE; talent in connecting with thought leaders and disseminating the needs and accomplishments of KSE to donors, stakeholders, and the world at large; expanding KSE to include a business school, and supporting the outstanding KSE Institute, which produces many white papers and studies of relevance in wartime that are regularly cited by international media, plus growing the KSE Charitable Foundation to assist in the financing of humanitarian endeavors in Ukraine. Such important activities require steadfastness, great intelligence, resilience, and ability to get data and information quickly. It also requires

innovation and associated thinking under immense pressures and even danger.

What also truly inspires us is his understanding of the importance of not only face to face education but also visiting supporters and donors and advocating for KSE and Ukraine in person.



It was wonderful to even have our exchange students from KSE take part in his visit. Special thanks to the UMass Amherst INFORMS Student Chapter and to its President, Doctoral Student Center Associate Dana Hassani, for helping out so much with the organization of his talk. Also, thanks to the Vice Provost for Global Affairs and the Director of the International Programs Office Kalpen Trivedi and to his outstanding assistant Kim Stender for making Mylovanov's visit so smooth, despite the short notice. For his interview, please, check out the chapter's youtube channel:

https://www.youtube.com/watch?v=h8tMP_TCF24&t=5s

Seminar at MIT

On March 26, 2024, Professor Anna Nagurney had the pleasure of speaking at MIT at the Center for Transportation and Logistics in its seminar series. She'd like to thank Austin Iglesias Saragih for the invitation to speak. The title of her presentation was: **Agricultural Supply Chain Networks: Trade, Policies, and Resilience.**

In her seminar, she first highlighted research done on food supply chains over the past decade with collaborators: Center Associates Min Yu of the University of Portland, Deniz Besik of the University of Richmond, and Pritha Dutta of Willamette University (all of whom were her former PhD students, and now are thriving as Professors), and, more recently, with her present PhD student Dana Hassani and collaborators at the Kyiv School of Economics (KSE) Professor Oleg Nivievskiy and Dr. Pavlo Martyshev.

In her presentation, she did a deep dive into the paper, **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.

The paper was the lead article in the volume and was also displayed at the INFORMS Phoenix conference. In the below photo the Center Director is standing next to the journal Editor, Professor Sergiy Butenko, and her PhD student Dana Hassani. The Springer editors Razia Amzad and Christian Rauscher are next to Dana.



Below the Center Director is with Emilio Alvarez-Flores, who was a student of hers at the Isenberg School, and who is now pursuing an MBA at Sloan at MIT, and with Austin.



At MIT at the Center for Transportation and Logistics

POMS Conference in Minneapolis

The Center Director would like to thank the organizers of the 2024 POMS Conference, which took place in Minneapolis, Minnesota, April 25-29. Both Isenberg School of Management PhD student, Dana Hassani, and the Center Director presented at this conference and Dana also took part on the Doctoral Colloquium as did another Operations Management Isenberg School PhD student, Busra Karkili. Dana shared the lovely group photo below taken at the colloquium.



The POMS Doctoral Colloquium in Minneapolis



A Collage of Photos from the POMS Conference

It was great to see Center Associate Dong "Michelle" Li of Babson there and Center Associate Sara Saberi of WPI also took part.

It was extra special to have Professor Anna Nagurney's book: *Labor and Supply Chain Networks* on display at the Springer booth at the conference.

UMass Amherst INFORMS Party

The end of the academic year is filled with all sorts of celebratory events as well as award ceremonies.

The academic life is intense but extremely rewarding.

Professor Anna Nagurney has served as the Faculty Advisor of the UMass Amherst INFORMS Student Chapter since its founding in 2004 and next Fall we hope to mark its big 20th Anniversary! This Chapter is an outstanding collaboration between the Isenberg School of Management and the College of Engineering.

On May 9, 2024 after the classes were over at UMass Amherst, we hosted the end of the semester party at the Isenberg School of Management.

The students did a great job, under the leadership of this year's Chapter President, Dana Hassani, in organizing the event, which included ordering food from award-winning UMass Dining and Catering.

Professor Ladimer S. Nagurney of the University of Hartford brought several types of varenyky / pierogies (warm and buttered) and Polish sausages plus delicious Italian and Polish cookies.

Attendance of faculty and students was outstanding at this party, which demonstrates the warm and inclusive community that we have built at UMass Amherst of operations researchers!

At this party, we recognized both this year's and last year's incredible Chapter Officers with Outstanding Award Certificates that were framed. The Chapter has accomplished so much in terms of hosting speakers, leaders, and even panels plus their role in building community through social events, such as this party, are so very much appreciated.

Congratulations to the Chapter Officers, who received their Outstanding Service Awards and were able to attend: Dana Hassani, Ogechi Vivian Nwadiaru, Samirasadat Samadi, Paola Furlanetto, Sindhoora Prakash, Yukti Kathuria, G. Busra Karkili, and Ismael Pour. Yiwen Wang, Josh Gladstone, and Semih Boz were also recognized for their great service to this INFORMS Student Chapter.

Service as a Chapter Officer builds many skills, including leadership. And, for those students (many of the members are PhD students) who enter academia after receiving their doctorates, service activities are important, along with excelling at research and teaching. Universities run on those three "pillars."



A Collage of Photos from the UMass Amherst INFORMS Student Chapter Party

ISCRAM Conference in Germany

The ISCRAM conference took place recently in Munster, Germany, May 25-29, 2024. The conference focused on information systems for crisis response and management and attracted speakers from many countries.

The Center Director is thrilled that Professor Myroslava Kushnir of the Ukrainian Catholic University (UCU) in Lviv, Ukraine was able to present the paper, **Civilian-Military Integration of Ukrainian Defense Supply Chain** at this conference. The paper was co-authored by the Center Director and by Professor Renata Konrad of the Worcester Polytechnic Institute (WPI). For all three, Ukrainian is their first language.



Professor Kushnir presenting at ISCRAM

The paper was published in the refereed conference Proceedings and is open access. [It can be downloaded here.](#)

The Center Director started working with Myroslava Kushnir through the outstanding UMass Amherst - Kyiv School of Economics (KSE) partnership in which the 1st round of

Virtual Scholars had 15 scholars in Ukraine matched up with faculty hosts at UMass Amherst. 9 of the 15 were matched with faculty at the Isenberg School of Management at UMass Amherst. The Center Director had the pleasure of working with Myroslava and also with Elena Besedina of KSE and Pavlo Martyshev of KSE as well as Oleg Nivievskyi of KSE. She published papers with all of them, several also co-authored with Dana Hassani.

Nathan Greenfield wrote [this wonderful article in World University News about the meaning of this partnership and you can see therein quotes from Kushnir, Besedina, and Martyshev.](#)

Our research continues and we expect to have an announcement of the 2nd round of Virtual Scholars before too long.

Working with faculty and researchers in Ukraine has been incredibly humbling and inspirational.

Kudos and News

Congratulations to Center Associate Sara Saberi who was awarded promotion to Associate Professor with tenure at WPI! Sara previously held the position of Norton Assistant Professor at WPI.

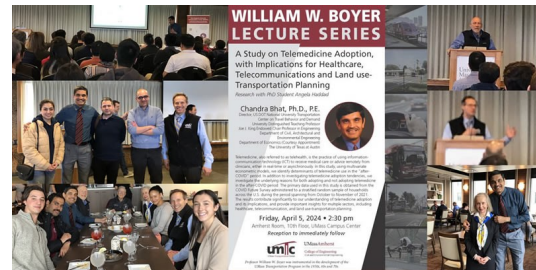
Kudos to Doctoral Student Center Associate Dana Hassani, who received two major awards this spring: the OIM Exceptional Impact Scholarship and the 2024 Outstanding Doctoral Student Research Award from the Isenberg School! Given that there are 7 departments at the Isenberg School and many PhD students this is quite the achievement. Dana also served as an instructor this spring semester and taught a required undergraduate course. Dana is taking his comprehensive exam this summer.

We welcome two new Doctoral Student Center Associates: Ismael Pour and Samira Samadi. They are working with the Center Director and already have been very active as Officers of the UMass Amherst INFORMS Student Chapter. Both are working on their core exam papers and have received acceptances to present papers at the INFORMS Conference in Seattle in the fall.

We are delighted that the new volume: *Dynamics of Disasters- From Natural Phenomena to Human Activity*, I.S. Kotsireas, A. Nagurney, P.M. Pardalos, S. Pickl, C. Vogiatzis, Editors, Springer Nature Switzerland AG (2024), is going into production soon. Congratulations to Dana Hassani, whose paper, **Quantification of International Trade Network Performance Under Disruptions to Supply, Transportation, and Demand Capacity, and Exchange Rates in Disasters**, co-authored

with A. Nagurney, O. Nivievskyi, and P. Martyshev, will appear in this volume.

We were honored to be invited to help to co-host, with Professor Mike Knodler, the Boyer Lecture given by Professor Chandra Bhat of the University of Texas Austin. Early in his academic career, he was a faculty member in the department of Civil and Environmental Engineering at UMass Amherst.



Collage of Photos from the Boyer Lecture

[Additional speakers that we hosted this spring can be found on the Chapter website.](#)

We are thrilled that Center Associates Sara Saberi, Deniz Besik of the University of Richmond, and Pritha Dutta of Willamette University, plus Center Associate Tina Wakolbinger of the Vienna University of Economics and Business, and the Center Director and Center Associate Ladimer S. Nagurney of the University of Hartford, will all be at the 33rd EURO Conference in Copenhagen, Denmark, June 30-July 3, 2024. Professor Tina Wakolbinger is on the Programme Committee of the EURO Conference.

Plus, prior to this conference, the Center Director and Ladimer S. Nagurney as well as Center Associate Dmytro Matsypura of the University of Sydney will be delivering papers at the conference: Optimization, Analytics, and Decisions in the Big Data Era in Honor of the 70th Birthday of Panos Pardalos. This conference will be held in Halkidiki, Greece, June 16-21, 2024. It is exciting that at this conference; [info on its website.](#)

Many thanks to Center Associate Professor Patrizia Daniele of the University of Catania, who is organizing the VINEPA (Variational Inequalities, Nash Equilibrium Problems and Applications) conference at her university. The conference will take place July 11-12, 2024. Professor Anna Nagurney is honored and delighted to be an invited speaker. [More info on the conference.](#) Additional conference information can be found on [the Supernetwork Center site.](#)

Recent Center Publications

Please see our center articles at:

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

Civilian-Military Integration in Ukrainian Defense Supply Chain, M. Kushnir, A. Nagurney, and R. Konrad, *Proceedings of the 21st ISCRAM Conference – Münster, Germany* May 2024, Berthold Penkert, Bernd Hellingrath, Monika Rode, Adam Widera, Michael Middelhoff, Kees Boersma, Matthias Kalthöner, Editors.

Commentary on Carroll & Esposito Amideo "Gender Equality: Opportunities and Challenges for the OR Community," A. Nagurney, *Journal of the Operational Research Society* (2024), **75(6)**, 1035–1038.

Schäden und Wiederaufbau der ukrainischen Infrastruktur (Damage and Reconstruction of Ukrainian Infrastructure) O. Nivievskiy, D. Goriunov, and A. Nagurney, *UKRAINE-ANALYSEN AUSGABE 296* (15.03.2024) — DOI: 10.31205/UA.296.03. For the English translation, see: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4831914

Multicommodity International Agricultural Trade Network Equilibrium, A. Nagurney (2024), in press in *Encyclopedia of Operations Management*, T.M. Choi, Editor, Elsevier.

Quantification of International Trade Network Performance Under Disruptions to Supply, Transportation, and Demand Capacity, and Exchange Rates in Disasters, A. Nagurney, D. Hassani, O. Nivievskiy, and P. Martyshev (2024), in press in: *Dynamics of Disasters- From Natural Phenomena to Human Activity*, I.S. Kotsireas, A. Nagurney, P.M. Pardalos, S. Pickl, C. Vogiatzis, Editors, Springer Nature Switzerland AG.

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.

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* (2024), **314(1)**, 1127-1142.

Food Security and Multicommodity Agricultural International Trade: Quantifying Optimal Consumer Subsidies for Nutritional Needs, A. Nagurney, *International Transactions in Operational Research* (2024), **31(3)**, 1375-1396.

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.

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 (2023), in: *Handbook for Management of Threats, Security and Defense, Resilience and Optimal Strategies*, K. Balomenos, A. Fytopoulos, and P.M. Pardalos, Editors, Springer Nature Switzerland AG 2023, pp. 39-57.

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.

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