

***Welcome to the
Supernetwork
Computation and
Visualization Laboratory!***



Funding provided by:



AT&T Foundation



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THE ROCKEFELLER FOUNDATION



John F. Smith Memorial
Fund - University of
Massachusetts at Amherst.

The Supernetwork Team

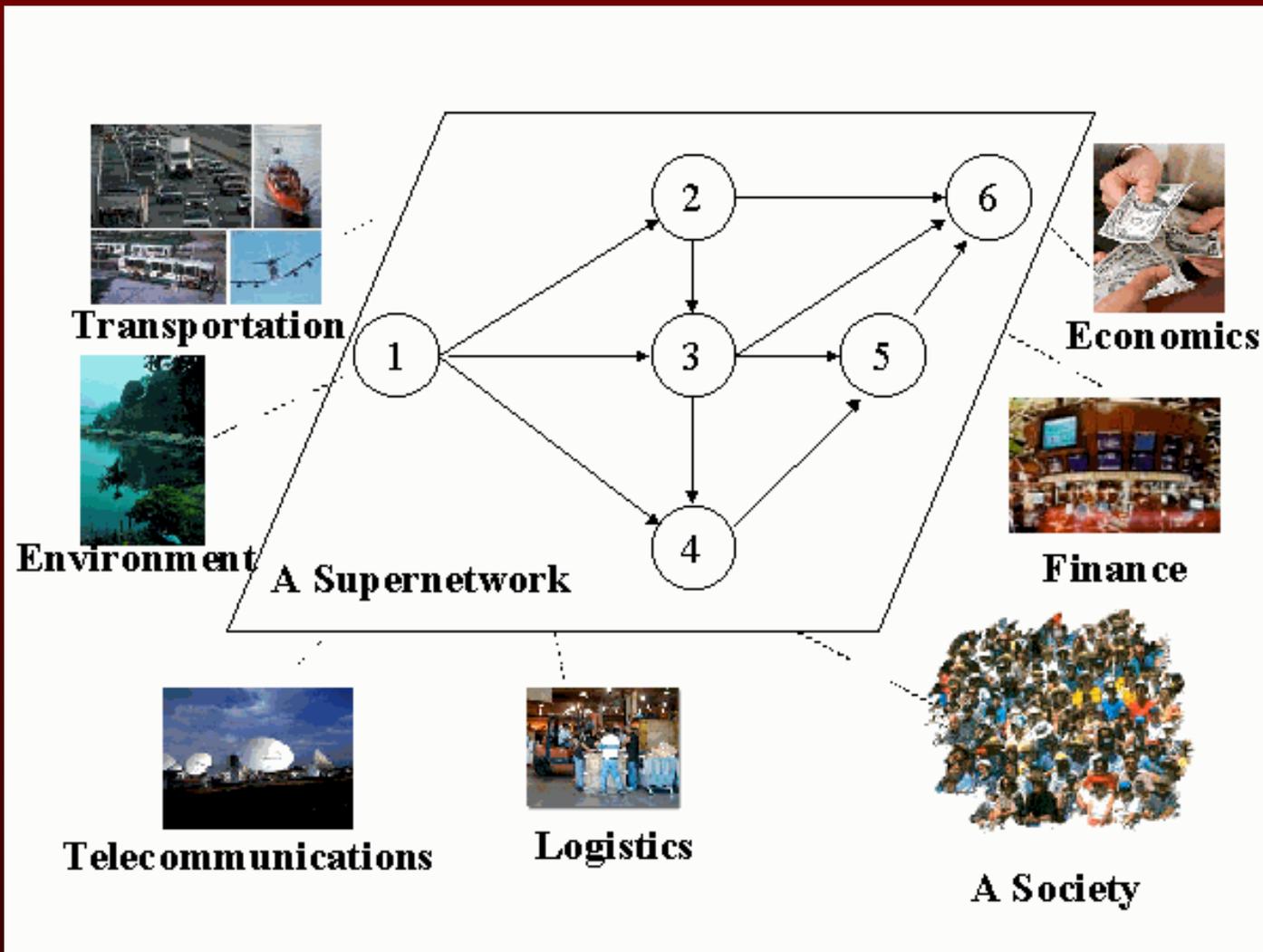


*Throughout history,
networks have served
as the foundation for
connecting humans to
one another and their
activities.*

Classical Networks

| Network System | Nodes | Links | Flows |
|--------------------------------|--|--|---|
| Transportation Urban | Intersections, Homes, Places of Work | Roads | Autos |
| Air | Airports | Airline Routes | Planes |
| Rail | Railyards | Railroad Track | Trains |
| Manufacturing and Logistics | Distribution Points, Processing Points | Routes Assembly Line | Parts, Products |
| Communication | Computers Satellites Phone Exchanges | Cables Radio Cables, Microwaves | Messages Messages Voice, Video |
| Energy | Pumping Stations Plants | Pipelines Pipelines | Water Gas, Oil |

Supernetworks: A New Paradigm



Reality of Today's Networks:

- *large-scale nature* and complexity of network topology;
- *congestion*;
- alternative behavior of users of the network, which may lead to *paradoxical phenomena*;
- the *interactions among networks* themselves such as in transportation versus telecommunications networks;
- *policies* surrounding networks today may have a *major impact* not only economically but also socially.

Supernetworks

- Supernetworks may be comprised of such networks as transportation, telecommunication, logistical, and/or financial networks.
- They may be *multilevel* as when they formalize the study of supply chain networks or *multitiered* as in the case of financial networks with intermediation.
- Decision-makers may be faced with multiple criteria; thus, the study of supernetworks also includes the study of *multicriteria decision-making*.

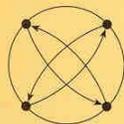


Supernetworks

Decision-Making for the Information Age

Anna Nagurney

June Dong

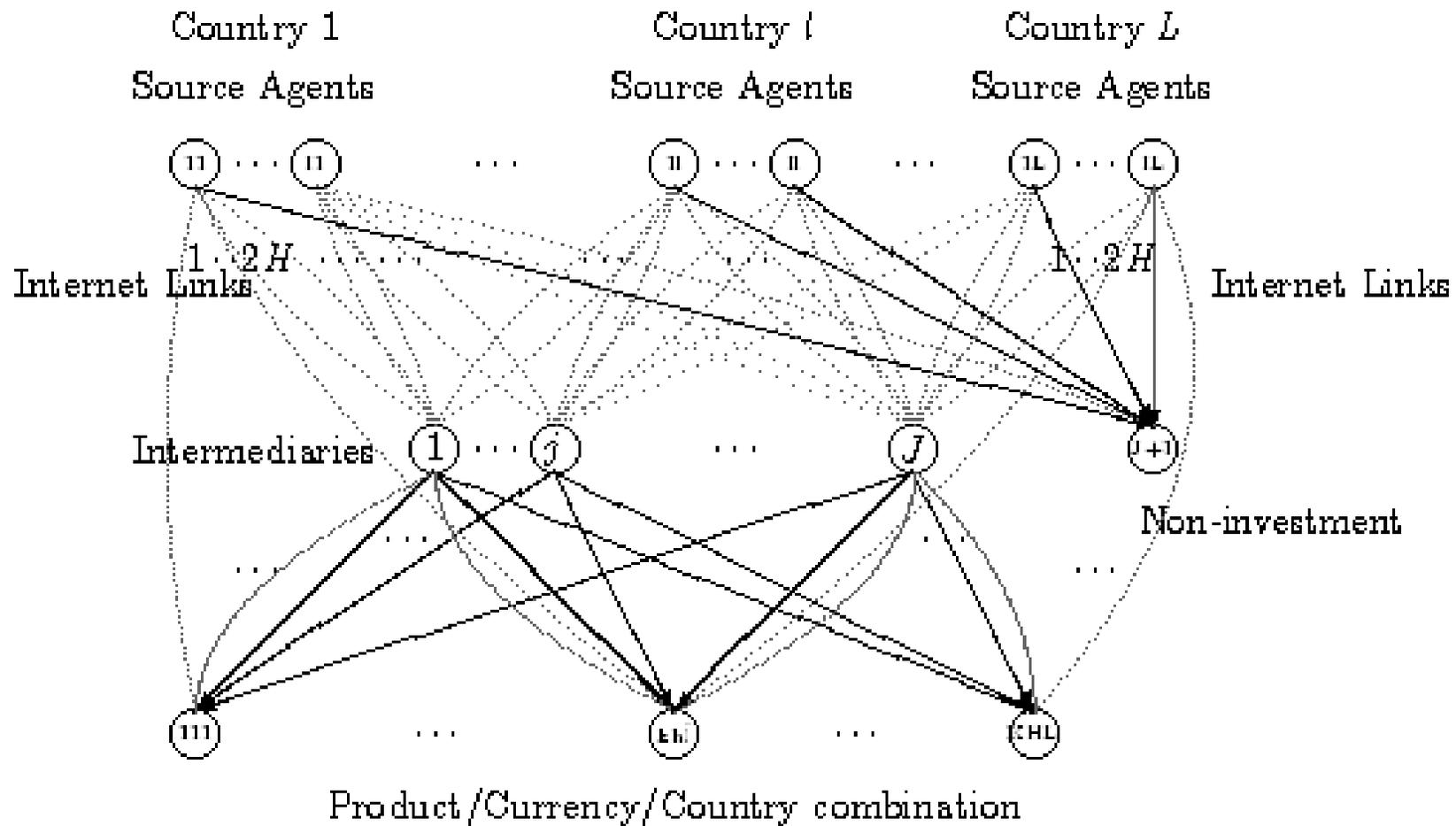


New Dimensions in Networks

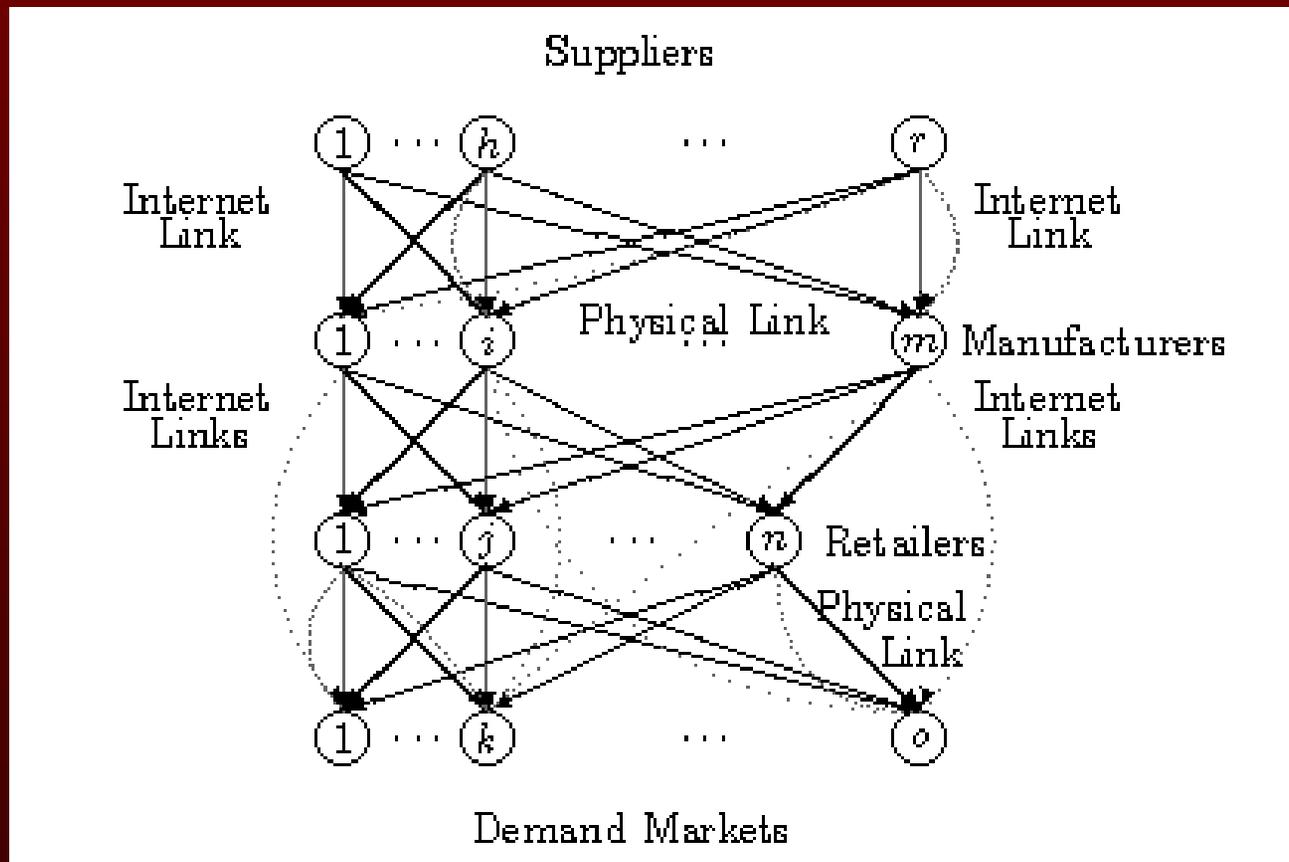
Applications of Supernetworks

- Financial Networks with Electronic Transactions
- Supply Chain Networks with Electronic Commerce
- Knowledge and Social Networks
- Recycling and Green Logistics
- Power Grids / Energy Networks
- Telecommuting/Commuting Decision-Making
- Teleshopping/Shopping Decision-Making

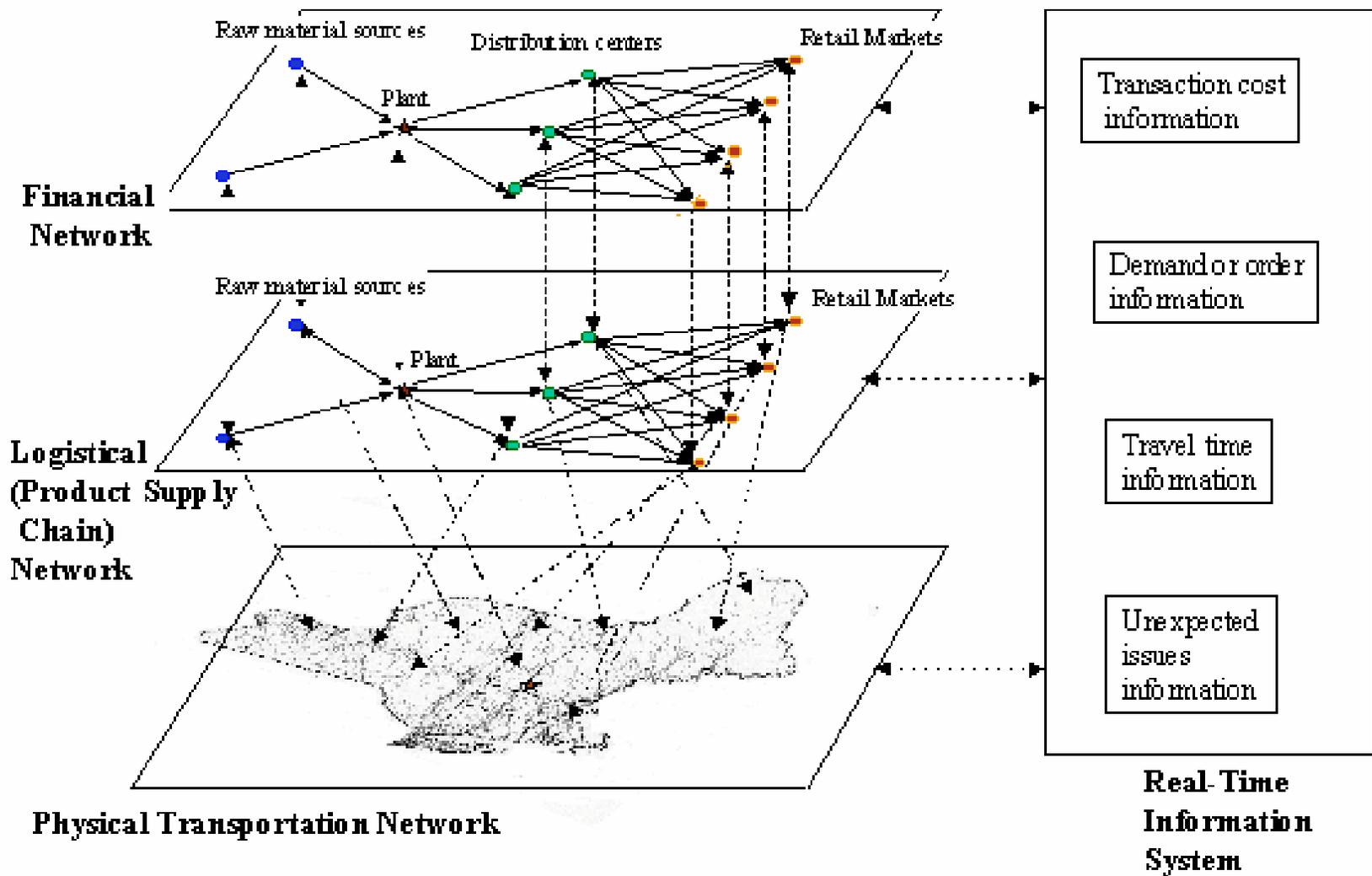
International Financial Networks with Electronic Transactions



The Supernetwork Structure of a Supply Chain Network

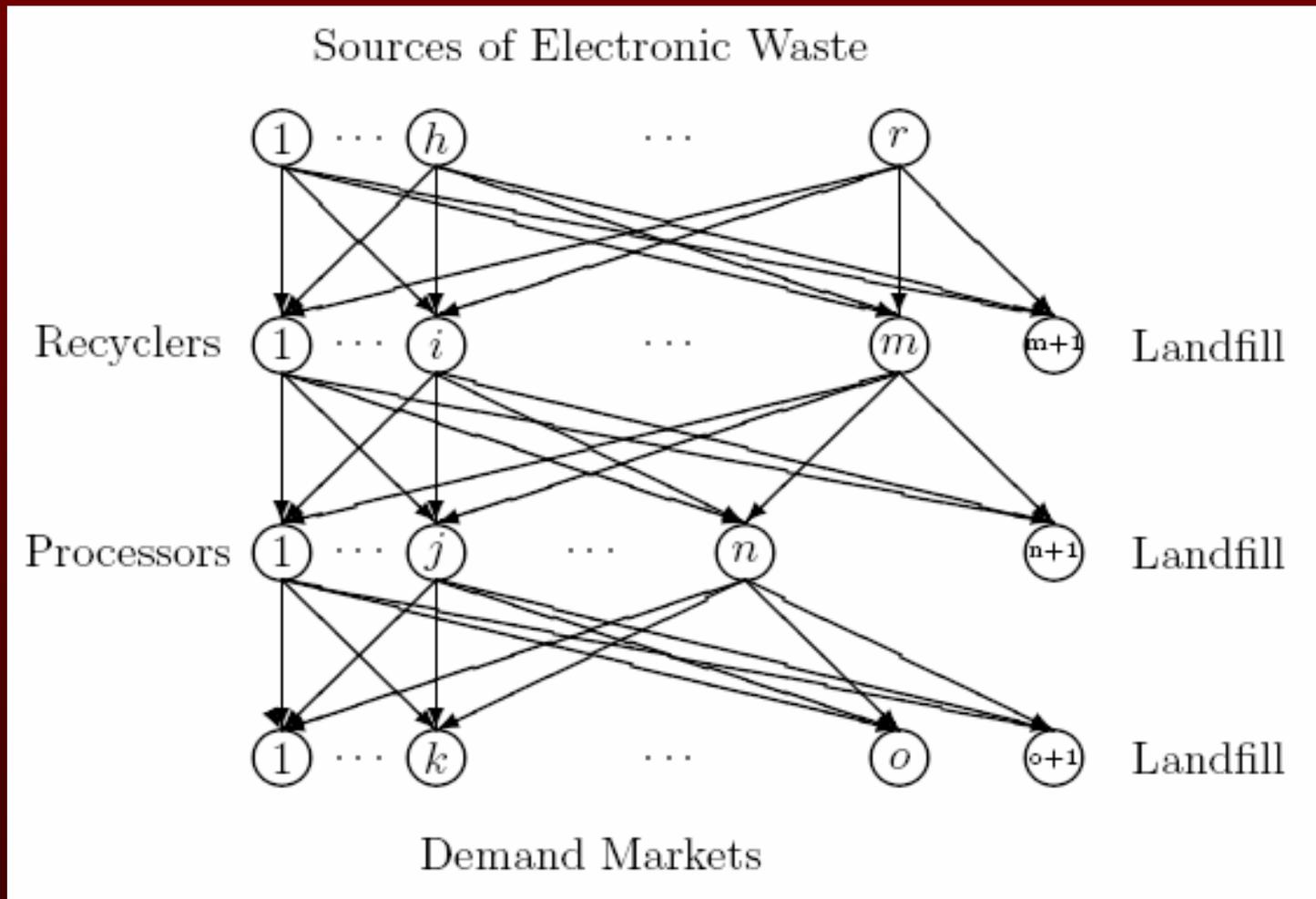


Supply Chain - Transportation Supernetwork Representation

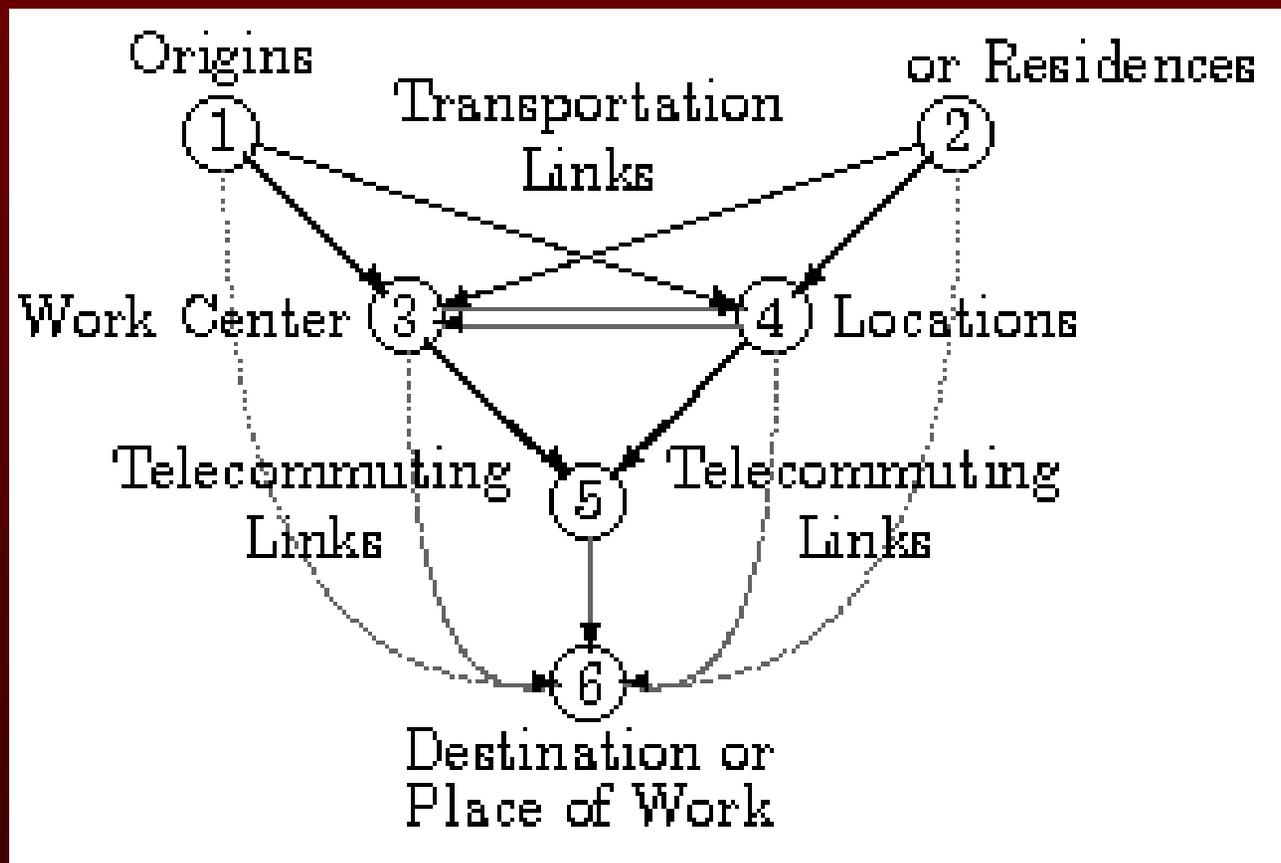


←---→ Two-way information exchanges between specific decision-makers

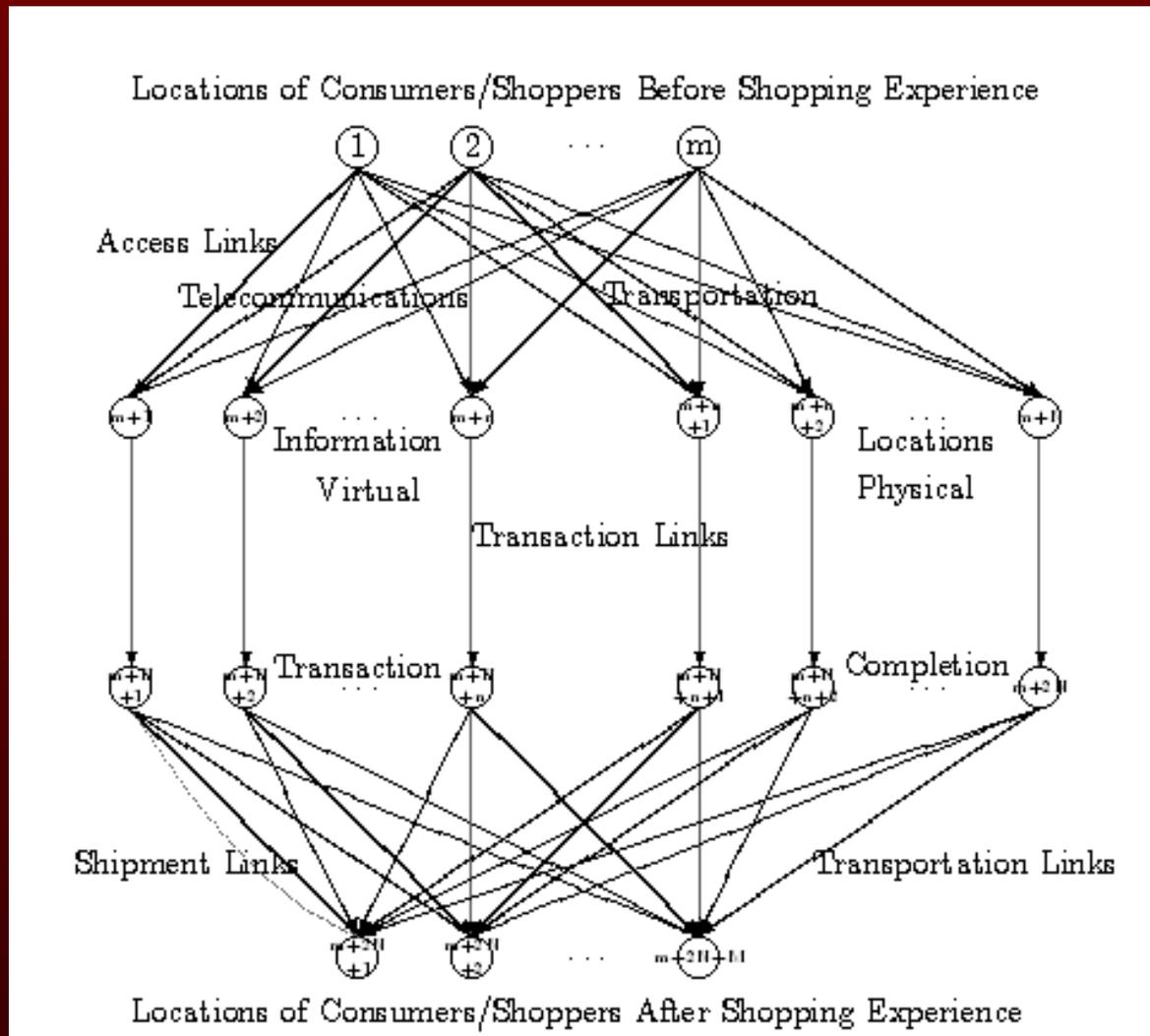
An E-Cycling Network



A Supernetwork Conceptualization of Commuting versus Telecommuting



A Supernetwork Framework for Teleshopping versus Shopping





NETWORK ECONOMICS

A VARIATIONAL INEQUALITY APPROACH,
REVISED SECOND EDITION

ANNA NAGURNEY

ADVANCES IN
COMPUTATIONAL
ECONOMICS

A. Nagurney · S. Siokos

Financial Networks

Statics
and Dynamics

ADVANCES IN
SPATIAL SCIENCE



PROJECTED DYNAMICAL SYSTEMS AND VARIATIONAL INEQUALITIES WITH APPLICATIONS

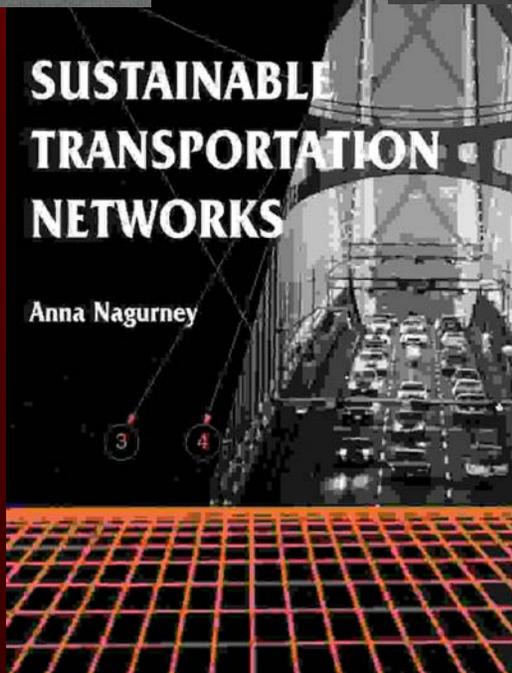
ANNA NAGURNEY
DING ZHANG



Kluwer's INTERNATIONAL SERIES

SUSTAINABLE TRANSPORTATION NETWORKS

Anna Nagurney



Environmental Networks

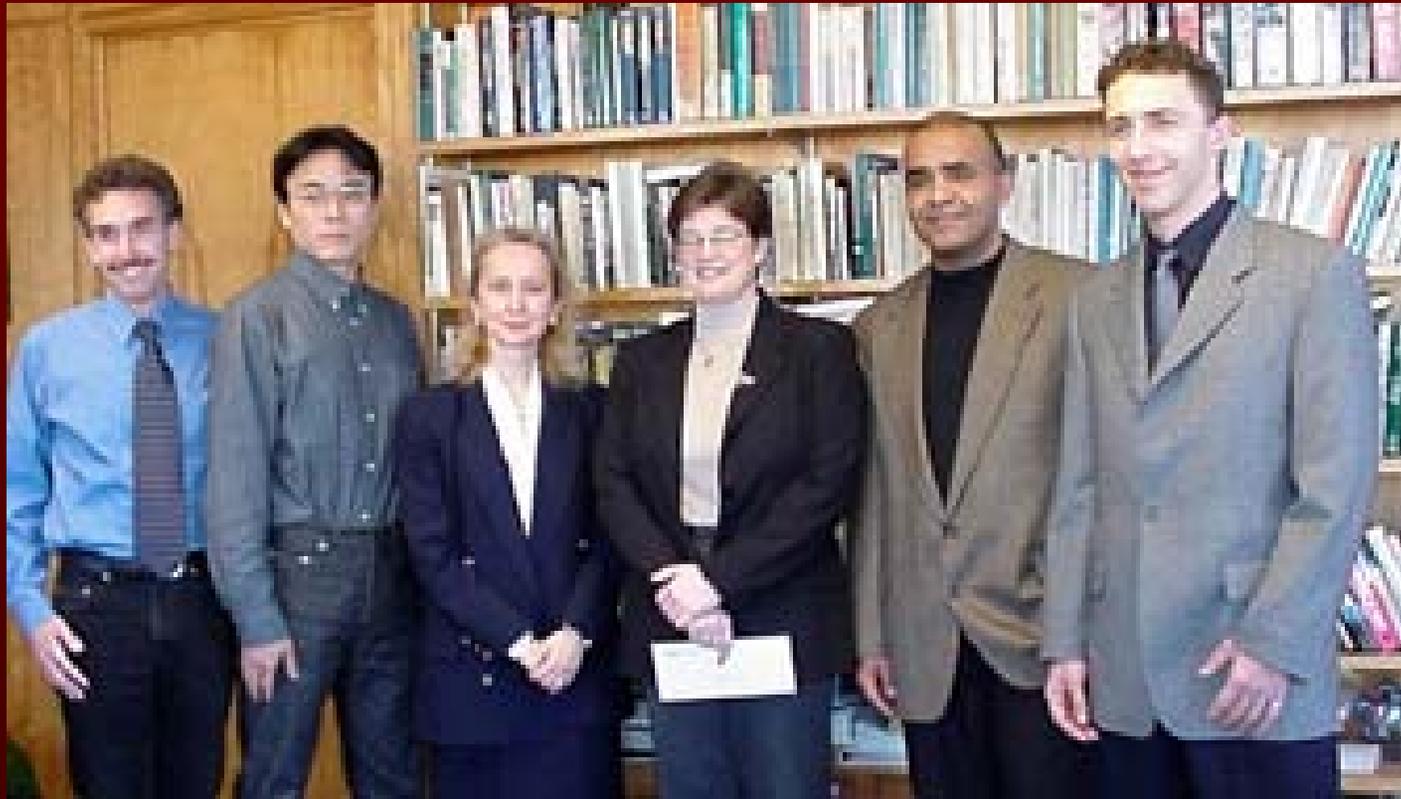
A FRAMEWORK FOR ECONOMIC DECISION-MAKING
AND POLICY ANALYSIS

KANWALROOP KATHY DHANDA
ANNA NAGURNEY
PADMA RAMANUJAM

NEW HORIZONS IN
ENVIRONMENTAL
ECONOMICS

General Editors
WALLACE E. OATES
HENK FOLMER

AT&T Industrial Ecology Fellowship Award - 2001



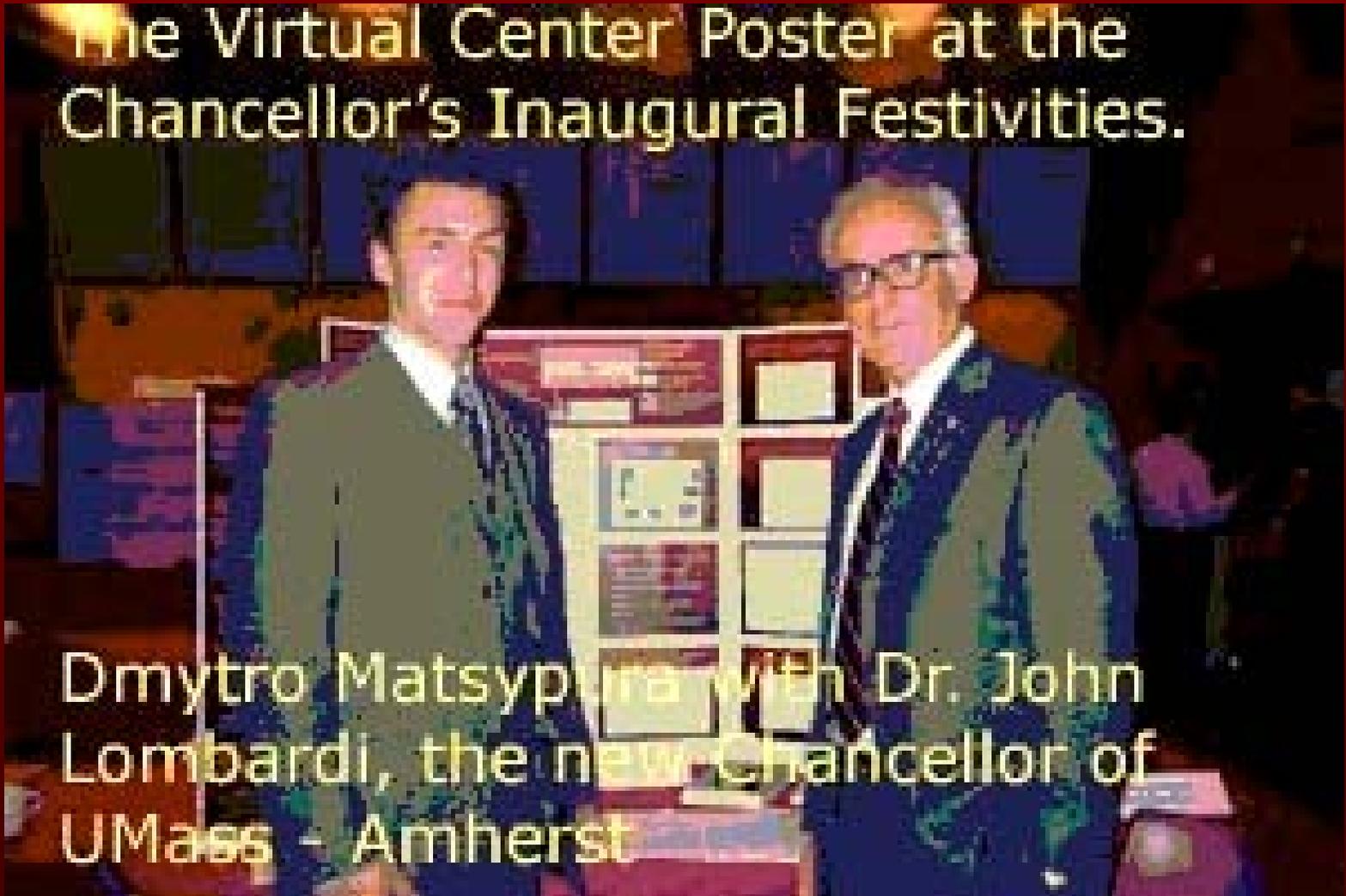
UMass Sustainability Conference November 2002



Sushi at the INFORMS San Jose Conference November 2002



The Virtual Center Poster at the
Chancellor's Inaugural Festivities.

A photograph of two men in suits standing in front of a poster. The man on the left is Dmytro Matsypura, and the man on the right is Dr. John Lombardi. They are both smiling and looking towards the camera. The poster behind them is titled 'The Virtual Center' and features several images and text. The background is dark, and the lighting is focused on the men and the poster.

Dmytro Matsypura with Dr. John
Lombardi, the new Chancellor of
UMass - Amherst.

Chancellor Lombardi's Inaugural Poster Session - February 2003



Jack Smith, UMass '60 Visits the Center February 2003



Jack Smith, UMass '60, Chairman,
General Motors, visits the Virtual Center



Alumnus Chris Sullivan '02 Visits the Center, April 2003



May 2003

*Congratulations to Center Associate
Christina Calvanese on being chosen a
UMass Leader for the 21st Century!*



TAP Paints the Lab Summer 2003



Proposal Defenses September 2003



Jose Cruz's



Ke Ke's

We survived the MKIDS Mini-Workshop September 2003



Kluwer appoints
Professors Anna
Nagurney and Hans
Amman as coeditors
of the journal
Netnomics.

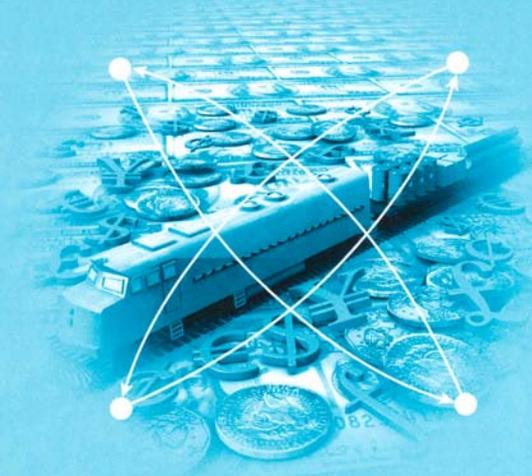


New Book!
November
2003



Innovations in Financial and Economic Networks

Edited by
Anna Nagurney



New Dimensions in Networks

David Boyce elected INFORMS Fellow - - nominated by Professor Nagurney



David Boyce receives the Robert Herman Lifetime Achievement Award in Transportation! Nominated by Prof. Nagurney, Prof. Mahmassani, and Prof. James Moore



Jose Cruz, Prof. Nagurney, Perakis and Kachani, INFORMS, Atlanta, 2003



The NETWORKS editorial board meeting, INFORMS, Atlanta, 2003



Prof. Nagurney, Prof. Pardalos and his students, INFORMS, Atlanta, 2003



Hobbs, Murphy, Entricken, and Cruz, INFORMS, Atlanta, 2003



The Isenberg and Christina Calvaneso visit on Alumni Weekend, October 2003



2001-2002 Center Associates



2002-2003 Undergraduate and Graduate Student Associates



Thank you!

For more information, see
<http://supernet.som.umass.edu>



Eugene M.
Isenberg
School of Management

**The Virtual Center
for
Supernetworks**