

Adaptive Cyberinfrastructure:

“Toward Reliable and Sustained Performance”

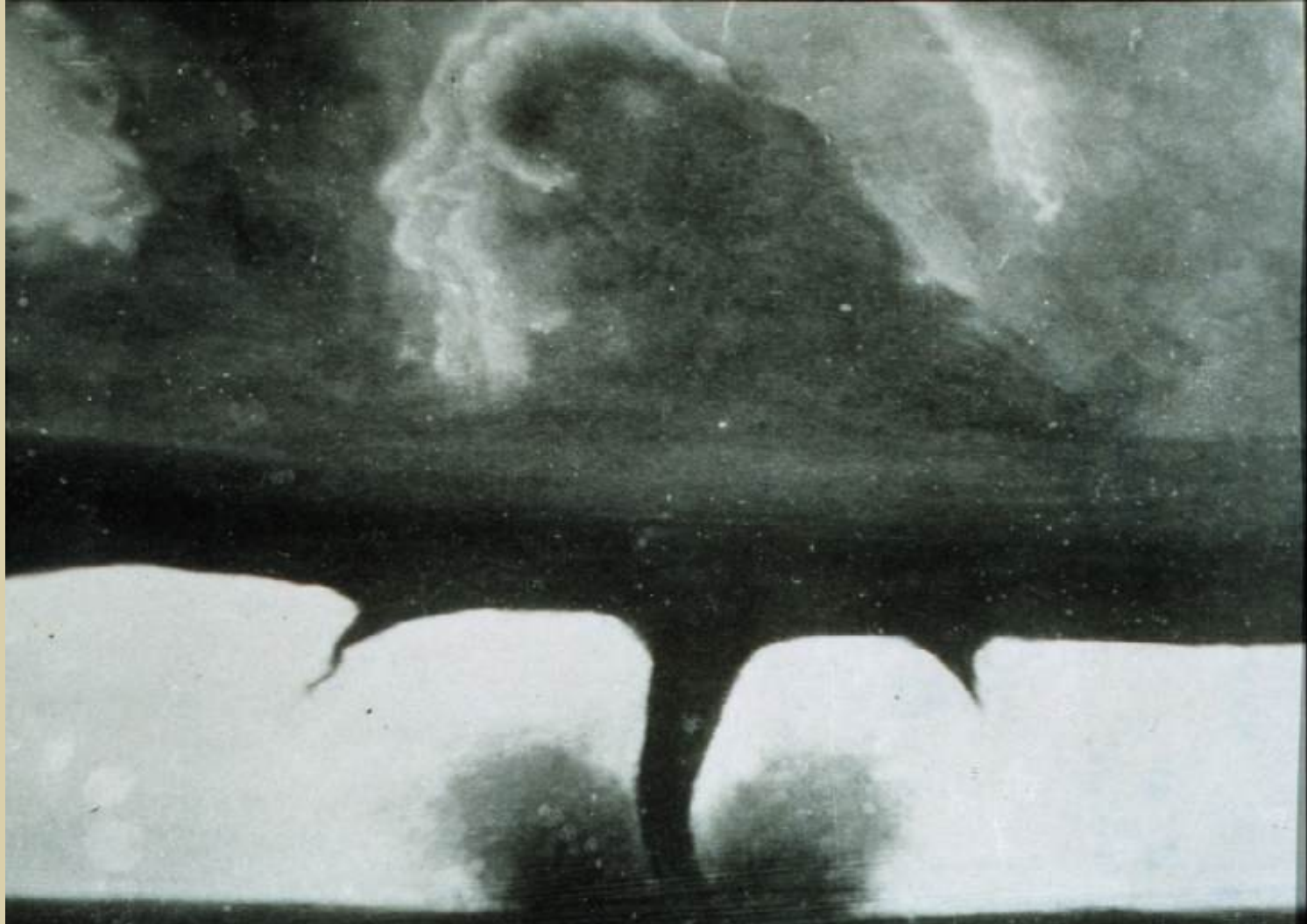
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- Intro & Motivation
- Research Domains
- High-Performance Computing Research
 - Application assessment tools
 - Resource management
 - Network adaptability
 - Energy and power management

- What will the Internet look like in 20 years?
 - NSF Global Environment for Network Innovations (GENI)
 - expected to lead to a transition of the Internet as we know it today
 - New ways to look at the “cyber-infrastructure”
 - Mobile Voice-activated Holograms
 - Large (exa-byte) data sets
 - PetaFLOP machine performance
 - Billions of interconnected “sensors” and “actuators” monitoring and controlling
 - Indoor environments
 - Outdoor environments
 - Biological forms

- Why?



- Sensor Networks
 - Resource constrained
 - Interesting challenges
 - Communication, energy
- High Performance Computing
 - Controllable
 - Subsystem noise
 - Monitoring, control, adaptation

- Application Assessment Tools
 - Run time sensitivities to subsystem interactions
- Resource management
 - System & application aware scheduling
- Network adaptability
 - System-aware re-routing
- Energy and power management
 - Machine and environment monitoring & control

- ACSL Cluster
 - 128-node NOW
 - Fast Ethernet
 - Distributed cluster segments
 - WSN instrumented
 - Power-aware operation
- Chiba City
 - 256-node, dual CPU
 - 192 usable nodes
 - Fast Ethernet
 - Myrinet interconnect
 - Fall 2007 setup
 - Students

- Cyber Center – A Discovery Park Center at Purdue University
- Information Technology at Purdue (ItaP)
 - Rosen Center for Advanced Computing (RCAC)
- Argonne National Laboratory

Thank You

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Questions?

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