Executive Priority
"President Obama Announces Launch of New Integrated Photonics Manufacturing Innovation Institute Competition" www.manufacturing.gov

Metro Traffic Overtakes Long Haul, Datacenters on Rise

Electronic Access & Aggregation Bottlenecks

Wide Area: Continental
- Nodes: 10^2
- Backbone: 10^10
- Regional/Metro: 10^8

Data Center: 1M Servers
- Elements:
  - 10^2 Scopes
  - 10^2 Leaf
  - 10^3 TOR
  - 10^6 Hosts

100 Gb/s!

Network Roadmap to the Future Internet

Working Group 1: Datacenters
- Optical Aggregative Central Reference Network
- optical aggregate
- optical network element
- optical network management
- metro optical transport
- regional optical transport
- backbone optical transport

Working Group 2: Wide Area
- Hybrid switching
- Cross-layer service awareness
- Optical hose layers
- Dynamic and intelligent hybrid switching
- On-demand, dynamically reconfigurable optical networking (DNRO)

Si Photonics: CIAN Chip

A new paradigm in integrated photonics research & innovation

Scaling from Nano to Macro

100 Gb/s!

Market Innovation Training
- Course on Entrepreneurship, IP, Startups

Education, Outreach & Diversity

IGN-NA REU Program
- 8 Native American undergraduate participants from 7 tribes nationwide: Assiniboine, Tohono O'odham, Navajo, Apache, Comanche, Blackfoot, and the Colorado River Indian Tribes.
  - Four student publications
  - Two conference presentations at AISES in Florida
  - One conference presentation at the Dark Skies Conference in Arizona.

ROKET RET Program
- 40 K-14 teachers of Native American youth nationwide
  - Outcomes include teacher-led programming such as research-inspired lesson plans, after-school programming, & school-university partnerships

Expect Academic Success in STEM
- Summer camp for Native American Youth

CIAN Supercourse
- MS PCE
- Certificate PCE
- University & Precollege Modules
- Optics Adventures Precollege Comic Book
- OPTI 500 PCE

102 104 106 108 Nodes:
100 Gb/s!

Regional/Metro Backbone
- TOR Hosts
- Leaf Spine

Elements:
- 100 Gb/s!