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The Nanotechnology Knowledge Infrastructure:
Enabling National Leadership in Sustainable Design

Lisa E. Friedersdorf, PhD
Deputy Director, National Nanotechnology Coordination Office

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Nanoinformatics 2015: Enabling Successful Discovery and Applications
Arlington, Virginia

- **What**?
- Why?
- Who?
- How?
- Intersection with other Federal Initiatives

NNI Signature Initiatives

The Nanotechnology Signature Initiatives (NSIs) spotlight areas of national significance that can be more rapidly advanced through focused and closely-coordinated inter-agency collaboration.

The NSIs

- **Address R&D gaps** within areas of critical national need
  - Identify research ***thrust areas***
  - Select ***key research targets*** associated with near-and long-term expected outcomes
- ***Leverage*** skills, resources, and capabilities among multiple NNI agencies to maximize scientific and technological progress
- Provide a forum for communication and ***ongoing assessment*** of direction and progress
- ***Catalyze*** communities of practice and public private partnerships to accelerate commercialization

Nanotechnology Signature Initiatives

- Nanotechnology for ***Solar Energy Collection and Conversion***
- ***Sustainable Nanomanufacturing***: Creating the Industries of the Future
- ***Nanoelectronics*** for 2020 and Beyond
- Nanotechnology ***Knowledge Infrastructure***: Enabling National Leadership in Sustainable Design
- Nanotechnology for ***Sensors and Sensors for Nanotechnology***: Improving and Protecting Health, Safety, and the Environment

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Nanotechnology Knowledge Infrastructure

Enabling National Leadership in Sustainable Design

Agencies involved: CPSC, DOD, EPA, FDA, NASA, NIH, NIOSH, NIST, NSF, OSHA

Goal: Provide a community-based, solutions-oriented knowledge infrastructure to accelerate nanotechnology discovery and innovation.

Thrust Areas:

- A diverse collaborative community of scientists, engineers, and technical staff to support research, development, and applications of nanotechnology to meet national challenges
- An agile modeling network for multidisciplinary intellectual collaboration that effectively couples experimental basic research, modeling, and applications development
- A sustainable cyber-toolbox to enable effective application of models and knowledge to nanomaterials design
- A robust digital nanotechnology data and information infrastructure to support effective data sharing, collaboration, and innovation across disciplines and applications

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Opportunities

To Enhance and Accelerate Nanotechnology

- **Create rapid and effective ways to share *diverse* data**
  - **Harness data as a discovery tool**
  - **Utilize data as a critical dimension of predictive modeling**
  - **Enhance the *efficiency* of data utilization**
- **Tame the infinite search spaces**
  - **Stimulate conceptual advances**
- **Enable the accessibility of "standard" computational tools**
  - **Empower researchers who are not computationally oriented**
  - **Toward a more quantitative understanding of complex phenomena**
  - **Stimulate design of new models and open new directions**
- **Transform the workforce to engage the challenges of tomorrow**

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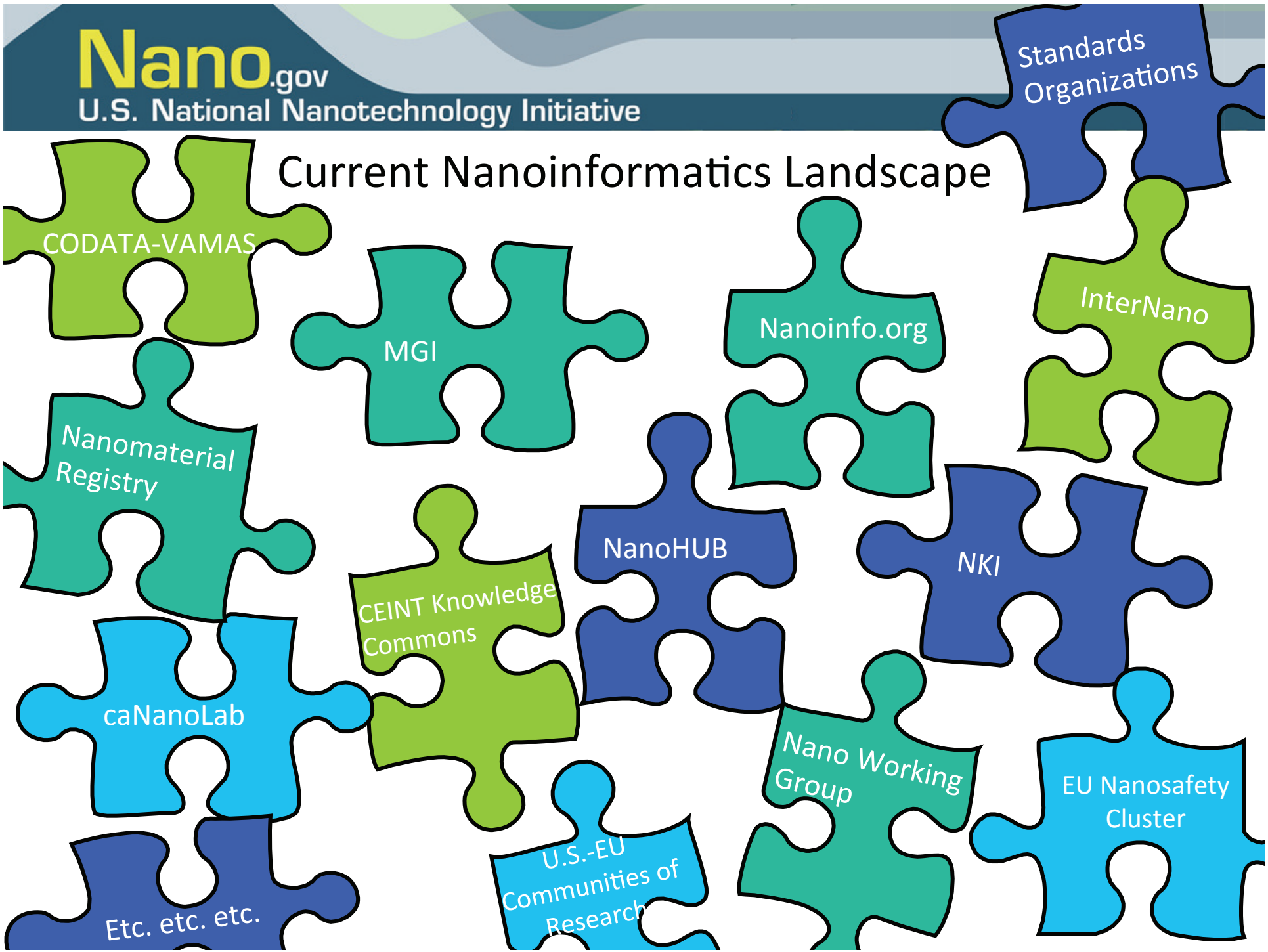
Current Nanoinformatics Landscape



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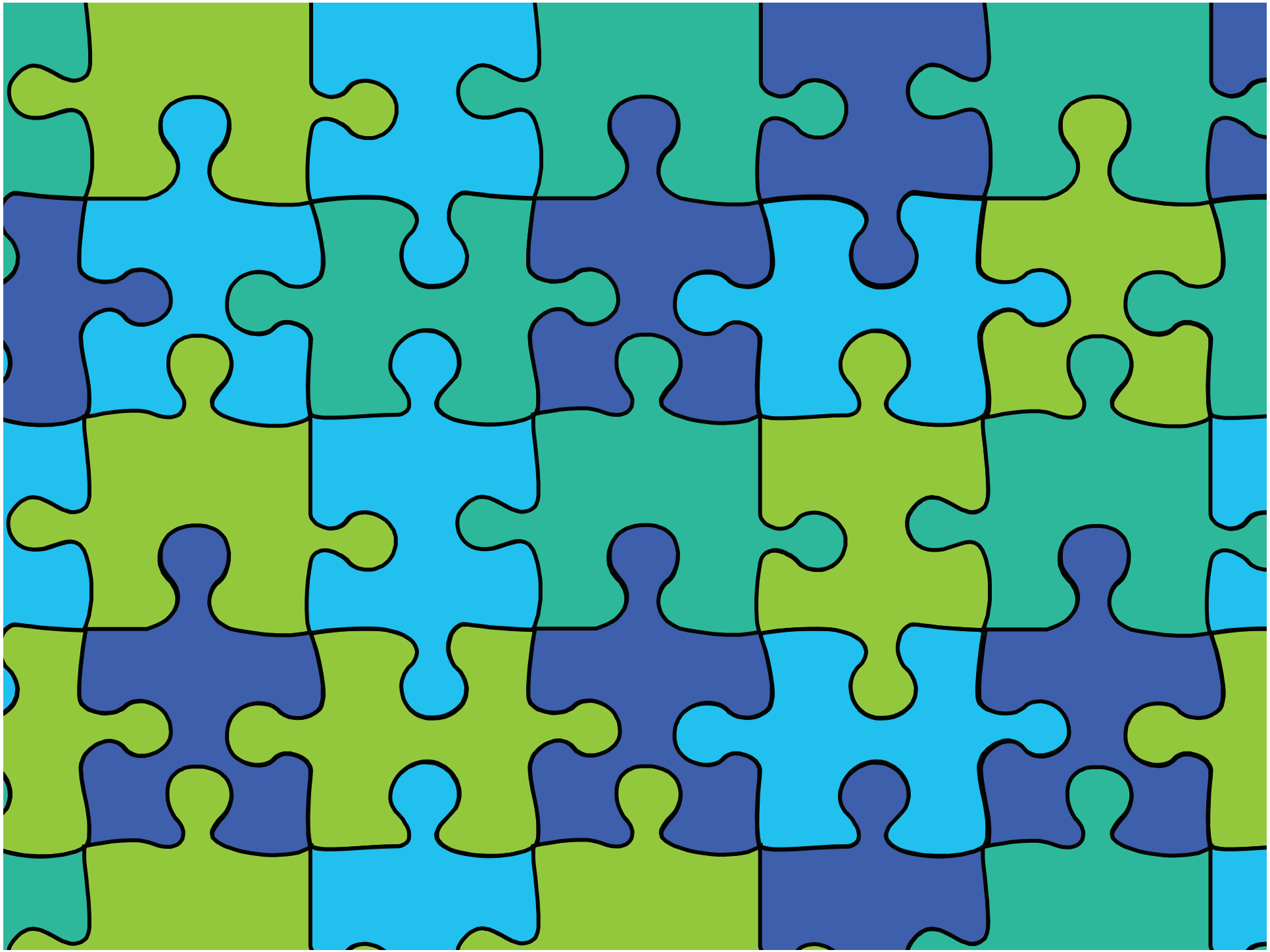

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An Invitation for Community Engagement

- Suggest joint case studies and/or pilot projects
- Contribute resources to the cyber toolbox
  - Send submissions to sstandridge@nnco.nano.gov