

SHYNE

Soft and Hybrid Nanotechnology
Experimental Resource

ILLUMINATE YOUR RESEARCH



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Materials Science and
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Physics



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Materials Science,
Chemical and Biological
Engineering,
Biomedical
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Jian Cao
Mechanical Engineering,
Civil and Environmental
Engineering, Materials
Science and Engineering



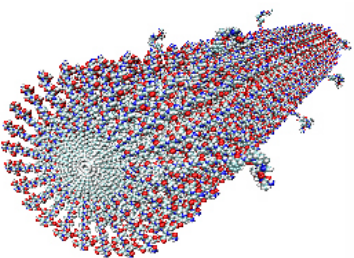
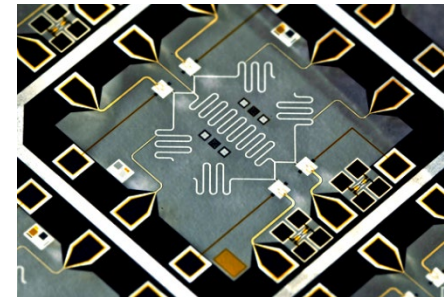
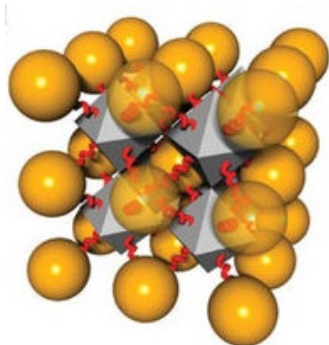
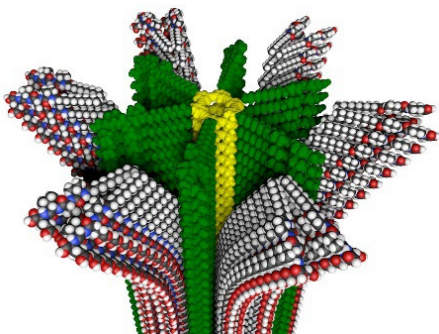
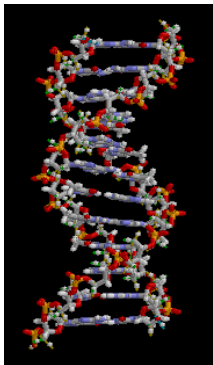
Andrew Cleland
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Engineering

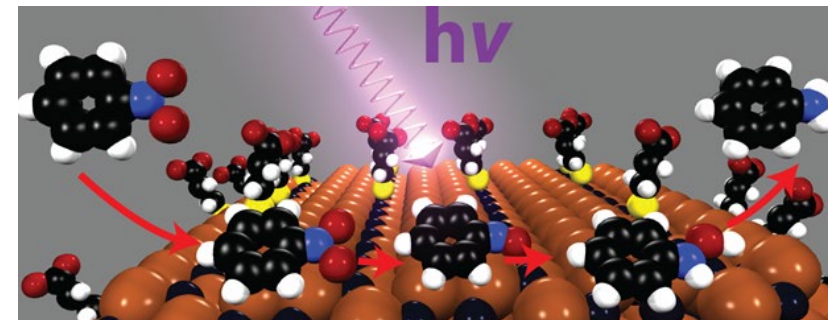
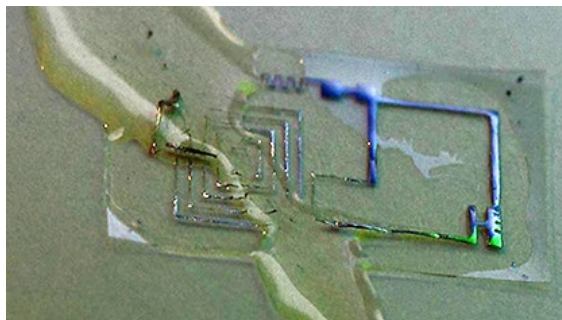
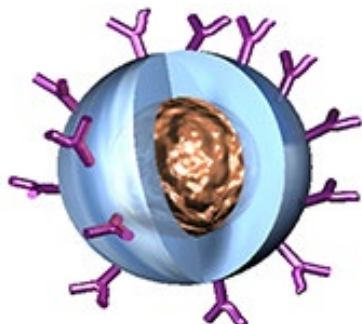
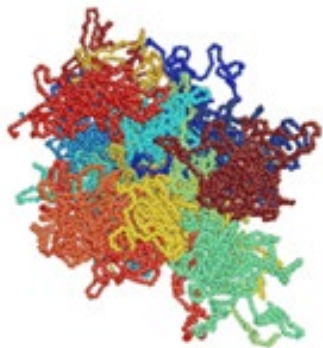
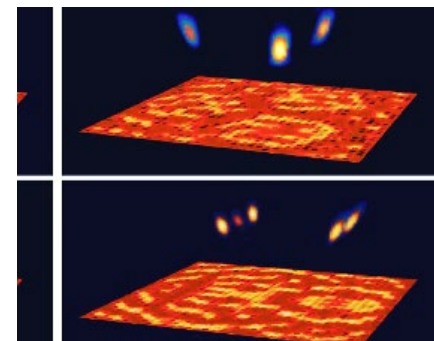


SHyNE - Soft & Hybrid (Soft-Hard) Nanotechnology Experimental Resource

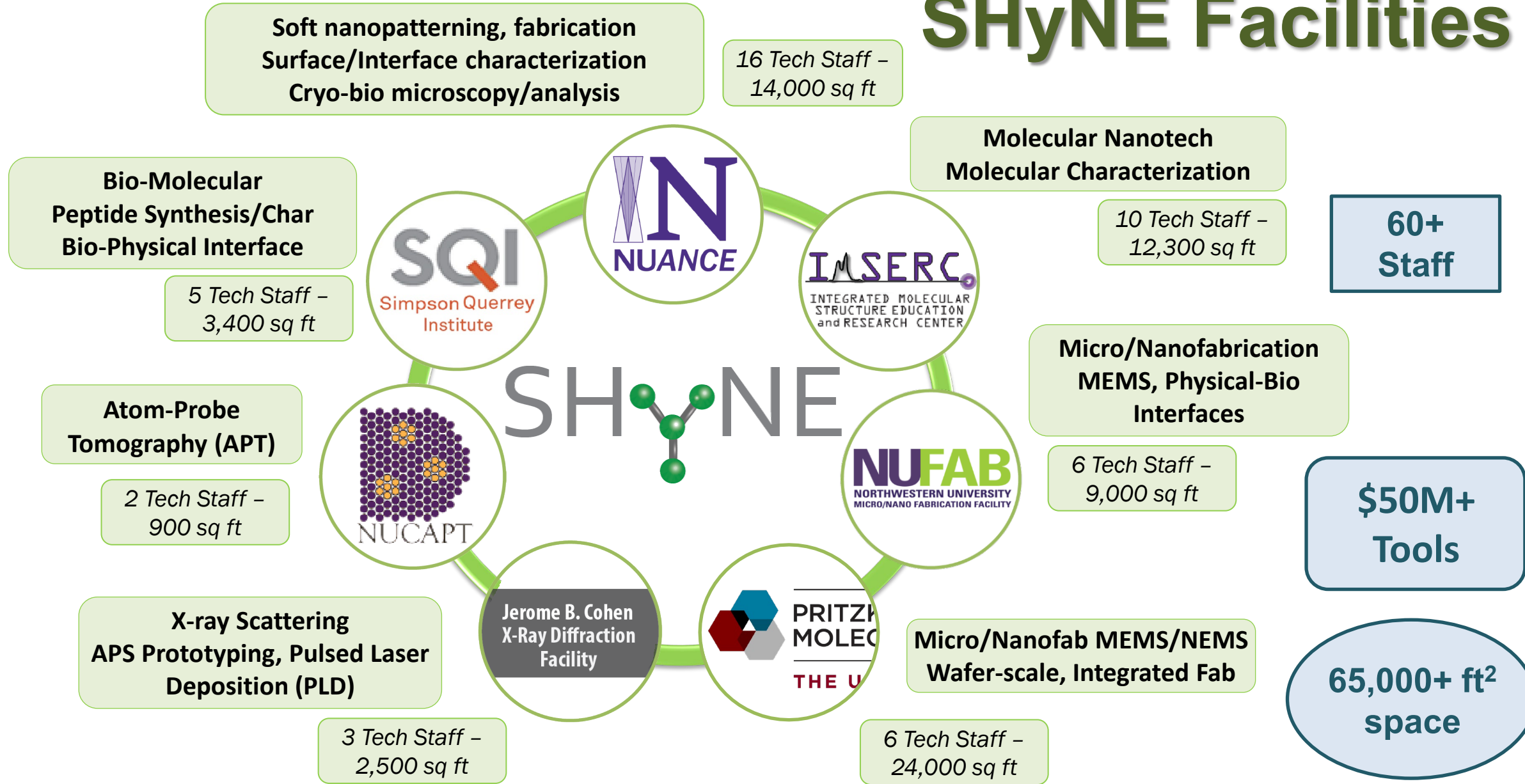


Soft

HARD



SHyNE Facilities



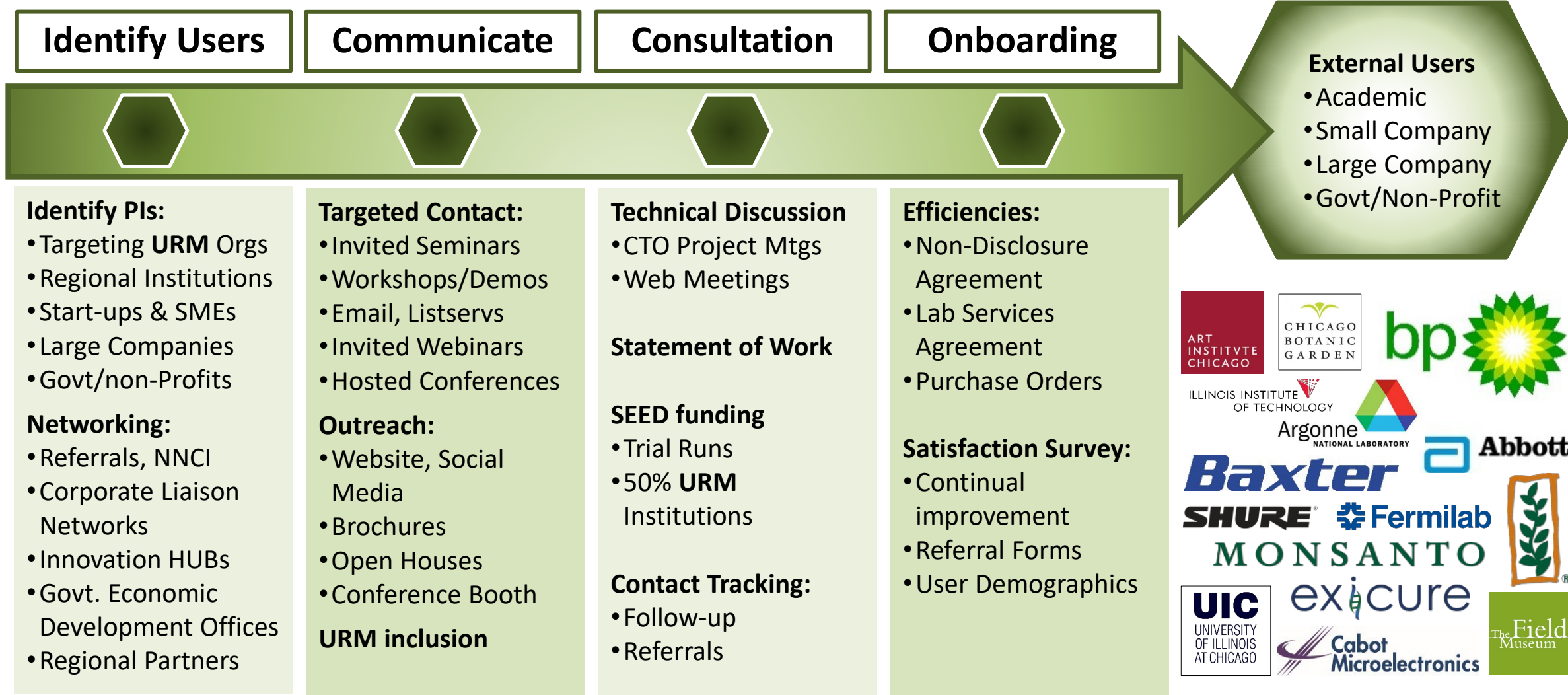
SHyNE Resource - *Mission Objectives & Initiatives*

Site Presentation Prompt (req'd):

- What are examples of programs and activities developed under NNCI that will be sustainable, independent of any continued NSF renewal funding, and
- ... what strategies or sources will be used to support them?

SHyNE Resource: Education and Outreach

Engaging External Users



SH_yNE – Integrated & Comprehensive Approach

Outreach and Education



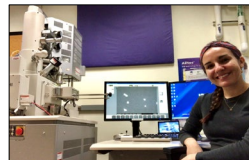
- Nano-Journalism, Social Media
- Nanotech Exhibits, Museums
- Lecture series, iNANO, M3S



- Industry Workshops, Demos
- Vendor Relations
- SEED Funding, Targeted Marketing



- Seminars, Courses, User meetings
- Technical Workgroups
- Proposal Development



- REU – Workforce Development
- CC Internship Program
- Open House, Image Contest



- RET - curriculum Development
- Science in Society (SiS) - camps, science clubs, Boys/Girls Clubs, URM
- Lab Tours, Demos, Remote Learning

Public, Community

Industry, Entrepreneurs

University, Faculty

Comm. College, Undergrad

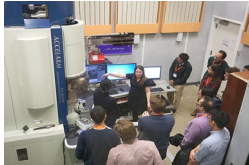
K-12

Diversity and Inclusion

- Science Chicago, Regional outreach
- Chicago Museums, URM community
- Women in Nano, SWE, SBE hiring



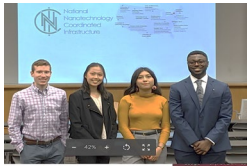
- Diversity Survey - demographics
- External user onboarding
- Improved tracking and metrics



- Targeting URM universities
- Diversity Survey – demographics
- Coordination: Dean Williams

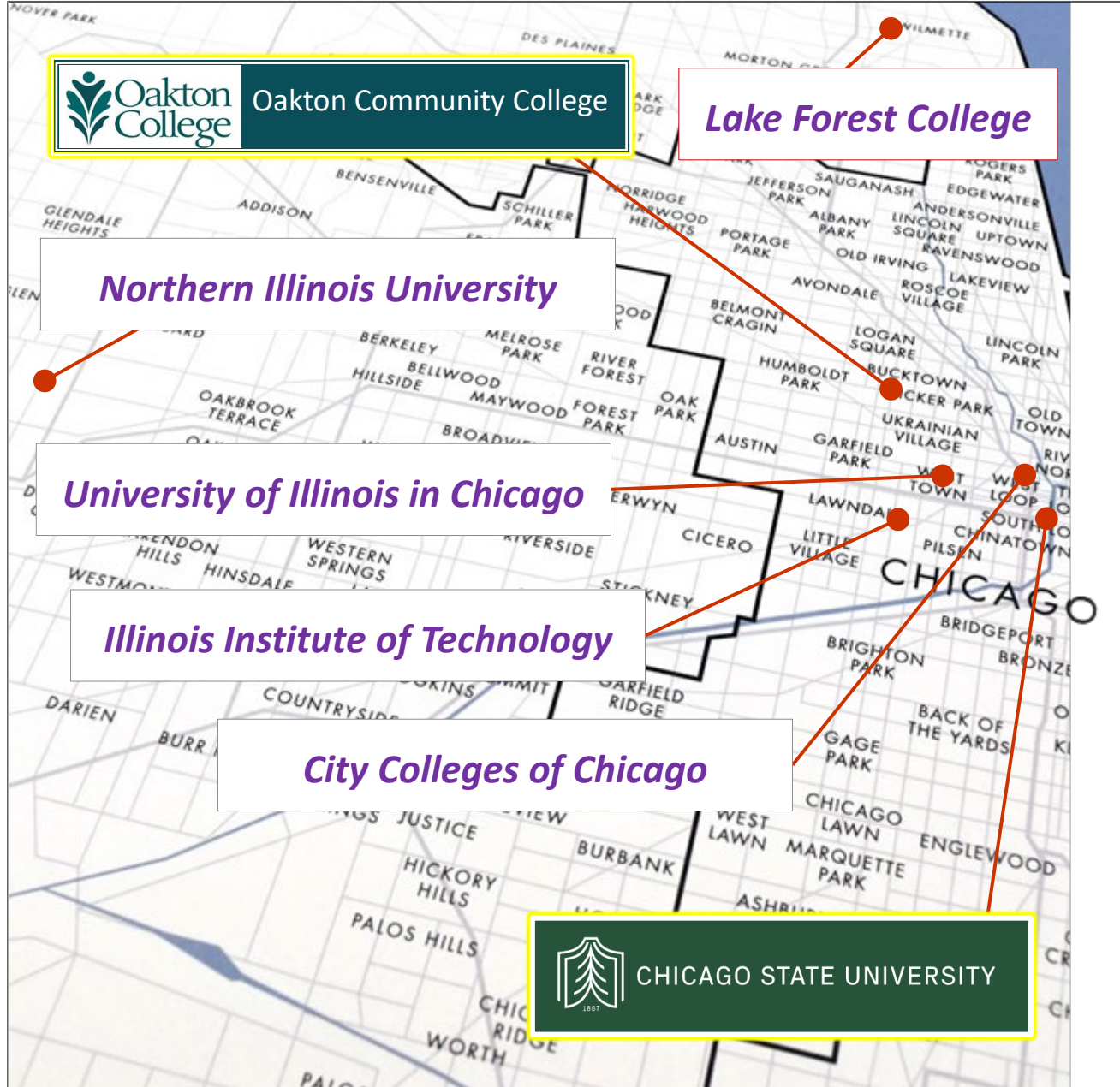


- SHyNE REU - 100% Women/URM
- Community College interns
- MRSEC REUs



- RET 100% URM teachers
- SiS Targets Chicago schools,
- Diversity Survey – demographics
- Tracking outcomes





Oakton Comm. College Internship

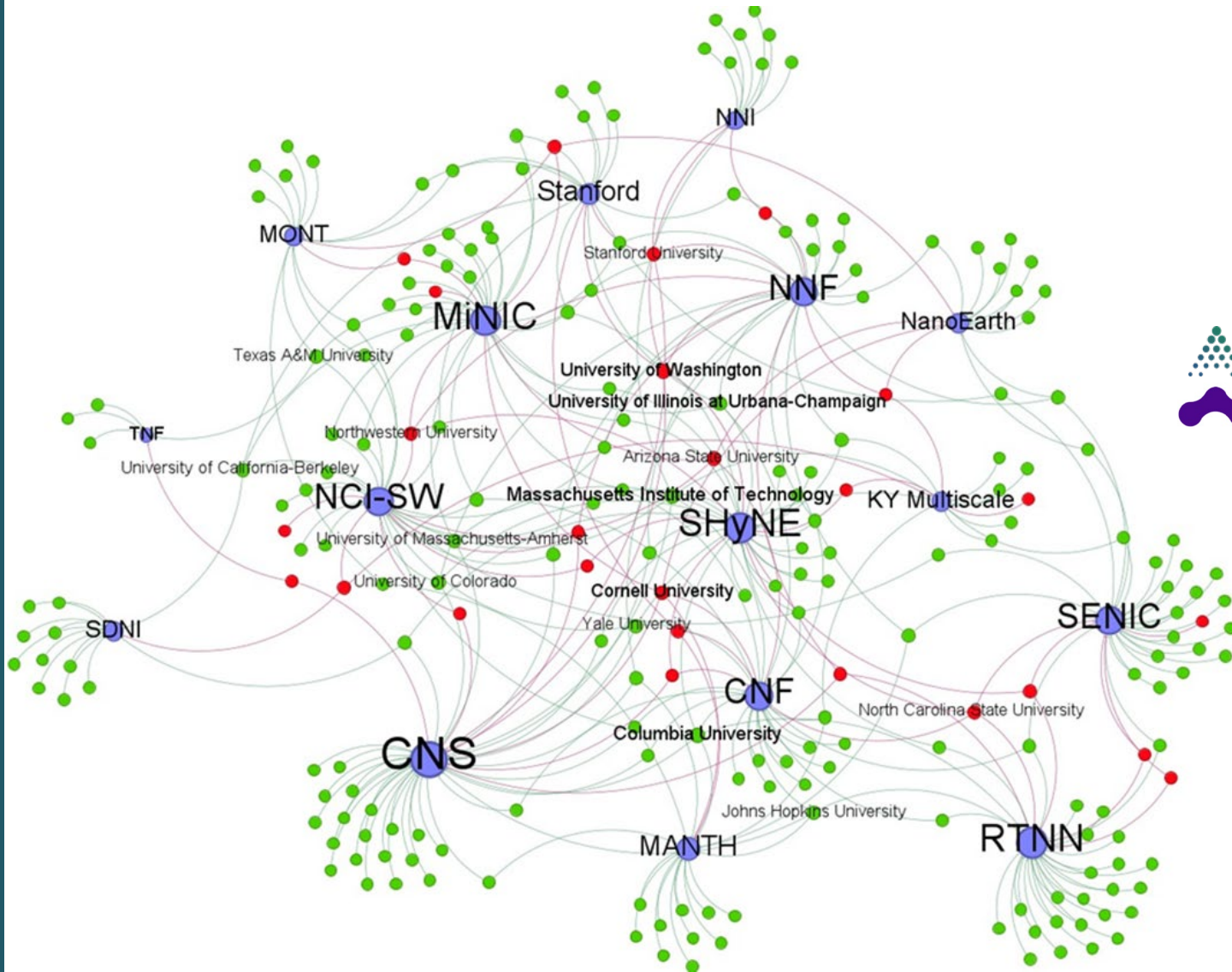


Chicago State University Undergraduate Summer Internship



SH_yNE Connections and Companies

SH_yNE - User Breadth and Data



nanoscale 3D additive manufacturing



graphene-based cathode, Li-batteries



quantum computing, superfluid helium



environmental remediation



synthetic biological pharmaceuticals



flexible thin-film transistor devices



nano for regenerative medicine



graphene-based anode, Li-batteries



surface treatments



solid-state 3rd generation sequencers



novel alloys via additive manufacturing



solar cell materials recycling



sustainable chemicals and fuels



MOCVD semiconductor structures



precision chemistry, health/environment



industrial water treatment



lab grown diamonds



cancer screening and diagnosis



SHyNE Resource - *Mission Objectives & Initiatives*

Panel topic (1 slide):

- ✓ For NNCI **Research Communities**, what worked, what didn't, and what are suggestions for what a future network might implement to support national priority research topics?

The “Other” Rules of Life!

1. LET IT GO

NEVER RUIN A GOOD DAY BY THINKING ABOUT A BAD DAY.

2. IGNORE THEM

DON'T LISTEN TO WHAT OTHER PEOPLE THINK OF YOU. LIVE A LIFE THAT IS EMPOWERING TO YOU.

3. GIVE IT TIME

GIVE IT SOME TIME, TIME HEALS ALL.

4. DON'T COMPARE

DON'T COMPARE YOURSELF; THE ONLY PERSON YOU SHOULD TRY TO BEAT IS THE PERSON YOU WERE YESTERDAY.

5. STAY CALM

STAY CALM AND KNOW THAT ITS OKAY TO NOT HAVE EVERYTHING FIGURED OUT.

6. IT'S ON YOU

YOU ARE IN CHARGE OF YOUR HAPPINESS AND HOW YOUR LIFE TURNS OUT.

7. SMILE

LIFE IS SHORT, ENJOY IT WHILE YOU HAVE IT.

7 RULES OF LIFE



1

Make peace with your past so it does not affect the present.

4

Don't compare your life to others and don't judge them. You have no idea what their journey is all about.

7 RULES OF LIFE



2

What others think of you is none of your business.

5

It's alright not to know all the answers. They will come to you when you least expect it.

3

Time heals almost everything, give it time.

6

You are in charge of your happiness.

7

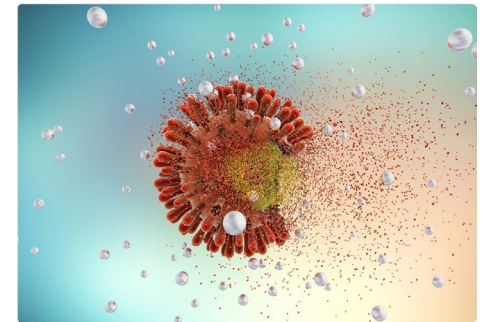
Smile. You don't own all the problems in the world.

| TheMindsJournal

MINDJOURNAL

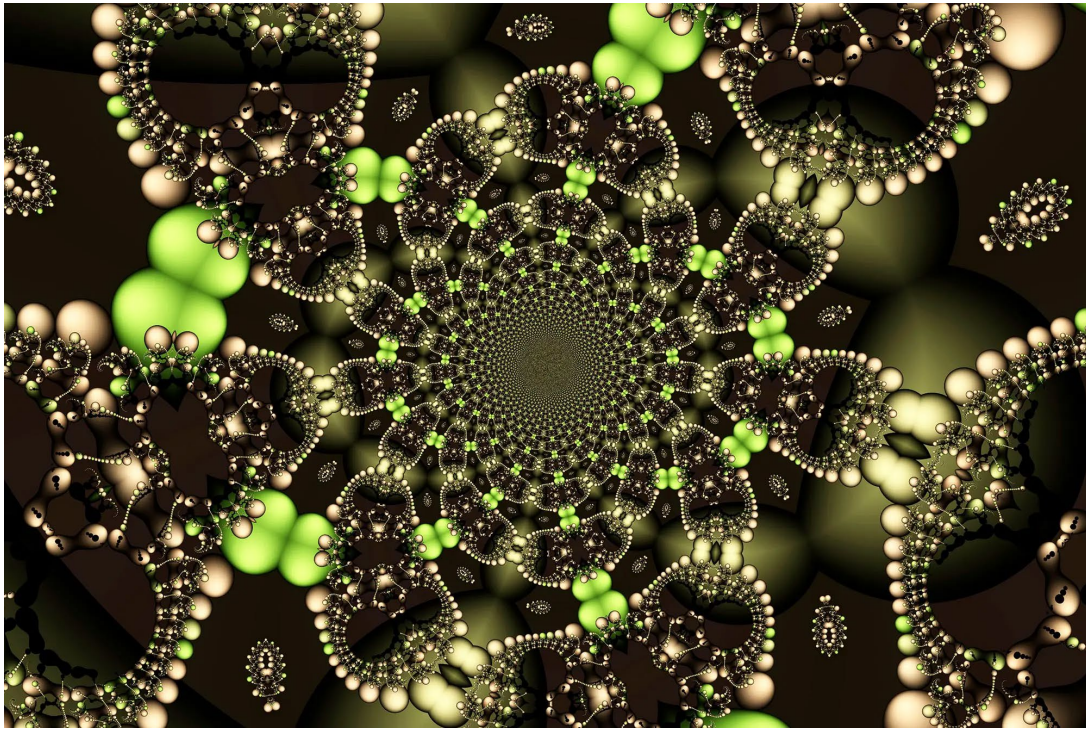
Rules of Life (RoL) Research Community (RC)

- **What, Why, etc..** Definitions, scope and scale; How "rules" of life function, develop research tools and infrastructure, train workforce.
- **Themes of NNCI Interest:** *Synthetic Biology; road-mapping, Imaging tools/methods; AI/ML, Diagnostics/Sensing,*
 - ➔ *Initial focus on “unconventional” fields and impact: Agriculture, food/water, enviro- nexus etc.*
- **How/what:** Quarterly RoL-RC meetings, RoL RC web portal; RoL site coordination & activities, shadowing, mirroring/sharing RoL events, webinars, etc.



Rules of Life (RoL) Research Community (RC)

RoL Activities, Coordination and Synergy



Potential Thrust Areas

- *Innovative (**synthetic biology**) tools and methods for health and environmental monitoring/diagnostics.*
- *“Road-mapping” for infrastructure and facility needs*
- *Training/strategy for collaborative culture and education related to RoL*
- *Networking & collaborations: (Bio-banks, CZ BioHubs, NIH Centers)*
- *Interdisciplinary education & workforce training*

Rules of Life (RoL) Research Community (RC)

- ✓ **What worked:** Significance of the technical theme, convergence of priorities, appreciation for its need, opportunities for integration of RoL into NNCI. (*Check DG slide/data on bio/unconventional users/usage*)
- ✓ **What didn't/in-progress:** still a complex theme, multiple facets, diffuse concepts; representation across Sites, prior mindset/foci on micro/nanofab, bandwidth and need for dedicated efforts
- ✓ **Suggestions for future;** (towards a) unified and coordinate framework for RoL; ID core technical foci; need for broader and specific representation across multiple Sites; reaching beyond NNCI sites – potential users of RoL RC; coordination with professional societies, vendors and consortia; allocation adequate resources for RCs..

SH_YNE – Workforce *IMPACT* Continuum

WORKFORCE DEVELOPMENT

