

nanoHUB

ALWAYS ON - 24/7
1.4M VISITORS

HUB usage 2016-01-01 00:00:00

 *New Registrations*

 *Simulation Users*

 *Tutorial / Lecture Users*



nanoHUB



nanoHUB

Typical Questions

Who are we? Impact?

Research OR Education?
Research? Good Research?
Classroom usage?

nanoHUB scalable?

Cycles? Support?
Developers?
Incentives?

Strategies?

Opportunity driven?
Goal setting, Diversity
Sustainability

Innovations

Web Delivery
Visualization
Analytics, UQ

Proposal

Vision

Culture Change
Sustainability

Vision

to create an energized, growing online community

Proposal
Vision
Culture Change
Sustainability

that accelerate the
transition of nanoscience to nanotechnology.

nanoHUB usage

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to create an energized, growing **online community** where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways **to continuously define new standards of learning and research** that accelerate the **transition of nanoscience to nanotechnology.**

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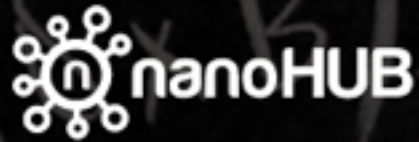
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nanoHUB - A fresh new look!



[RESOURCES](#) [MEMBERS](#) [EXPLORE](#) [NANOHUB-U](#) [PARTNERS](#) [ABOUT](#) [SUPPORT](#)

Logged in Help Search

NANO is HUGE

LARGEST NANOTECHNOLOGY ONLINE RESOURCE

400

simulation tools

1.4M

visitors

4500

resources

much more than a web site



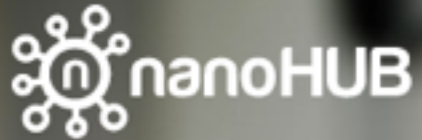
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LEARN

EXPERT CLASSES AT YOUR OWN PACE

much more than a web site

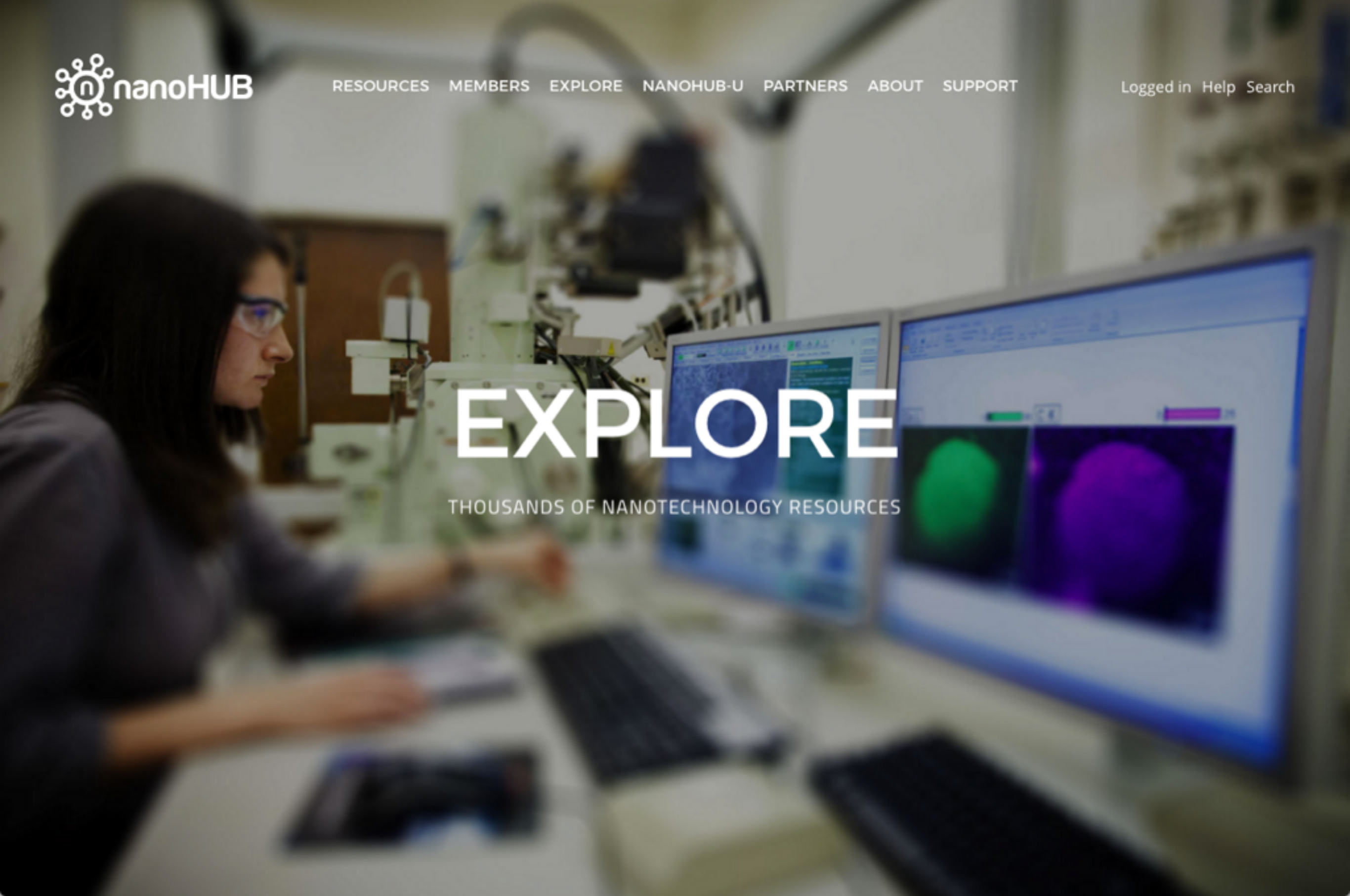


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EXPLORE

THOUSANDS OF NANOTECHNOLOGY RESOURCES



much more than a web site



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SIMULATE

HUNDREDS OF CUTTING-EDGE TOOLS TO PROPEL YOUR RESEARCH

nanoHUB

energized, growing



nanoHUB usage

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Research

researchers,

work together in new ways

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nanoHUB Citation Network (2000–2016)

1,550+ Papers

Each dot is a paper

Linked by

3,600+ authors

Social Network!

researchers,

work together in new ways



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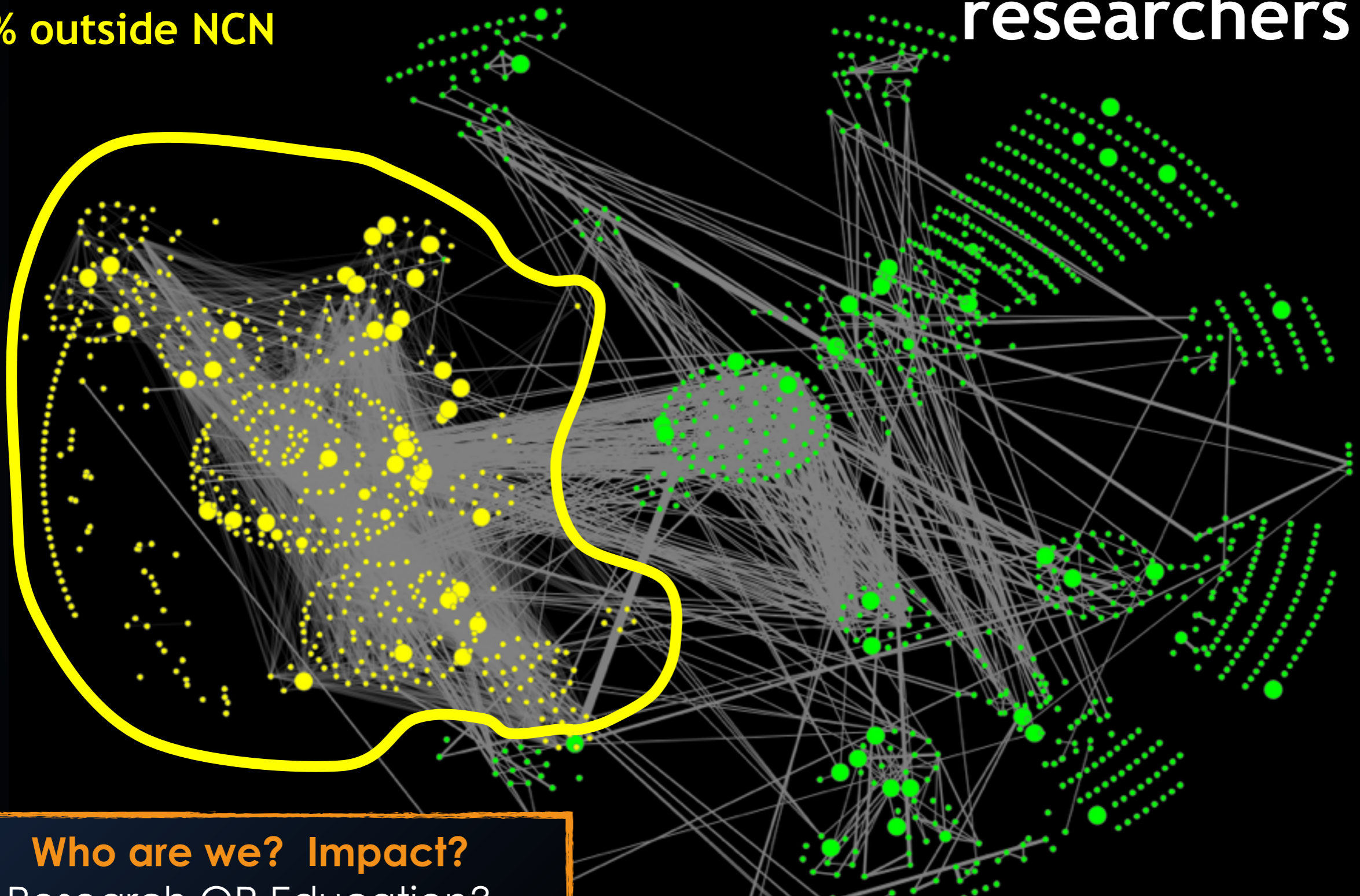


NCN vs. Non-NCN (2000-2016)

1,550+ Papers

64% outside NCN

researchers



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1,550+ Papers

Reference Types (2000–2016)

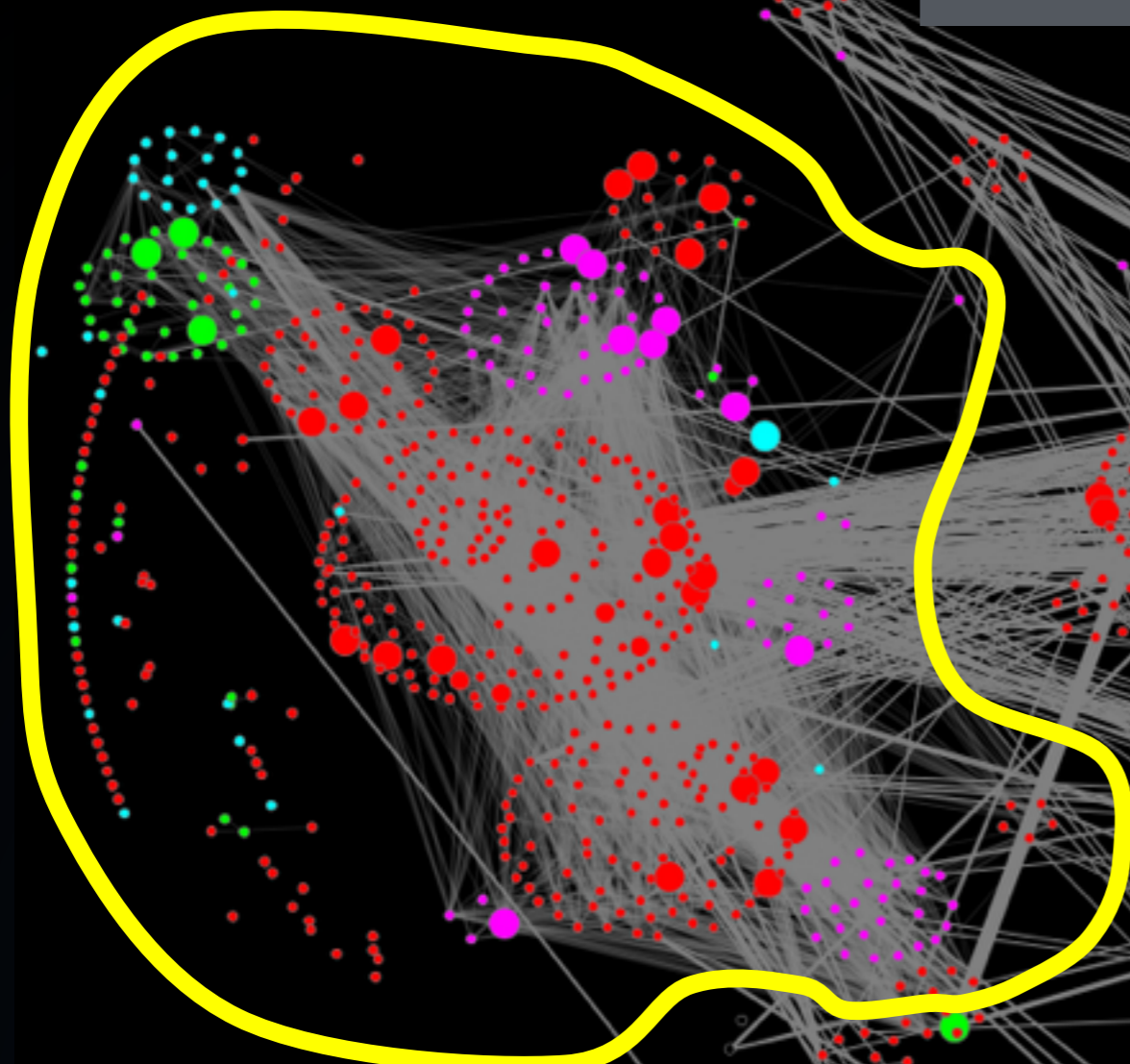
82% research

17% cyberinfrastr.

8% education

nano
researchers

7% Industry



educators

science

computer

educators

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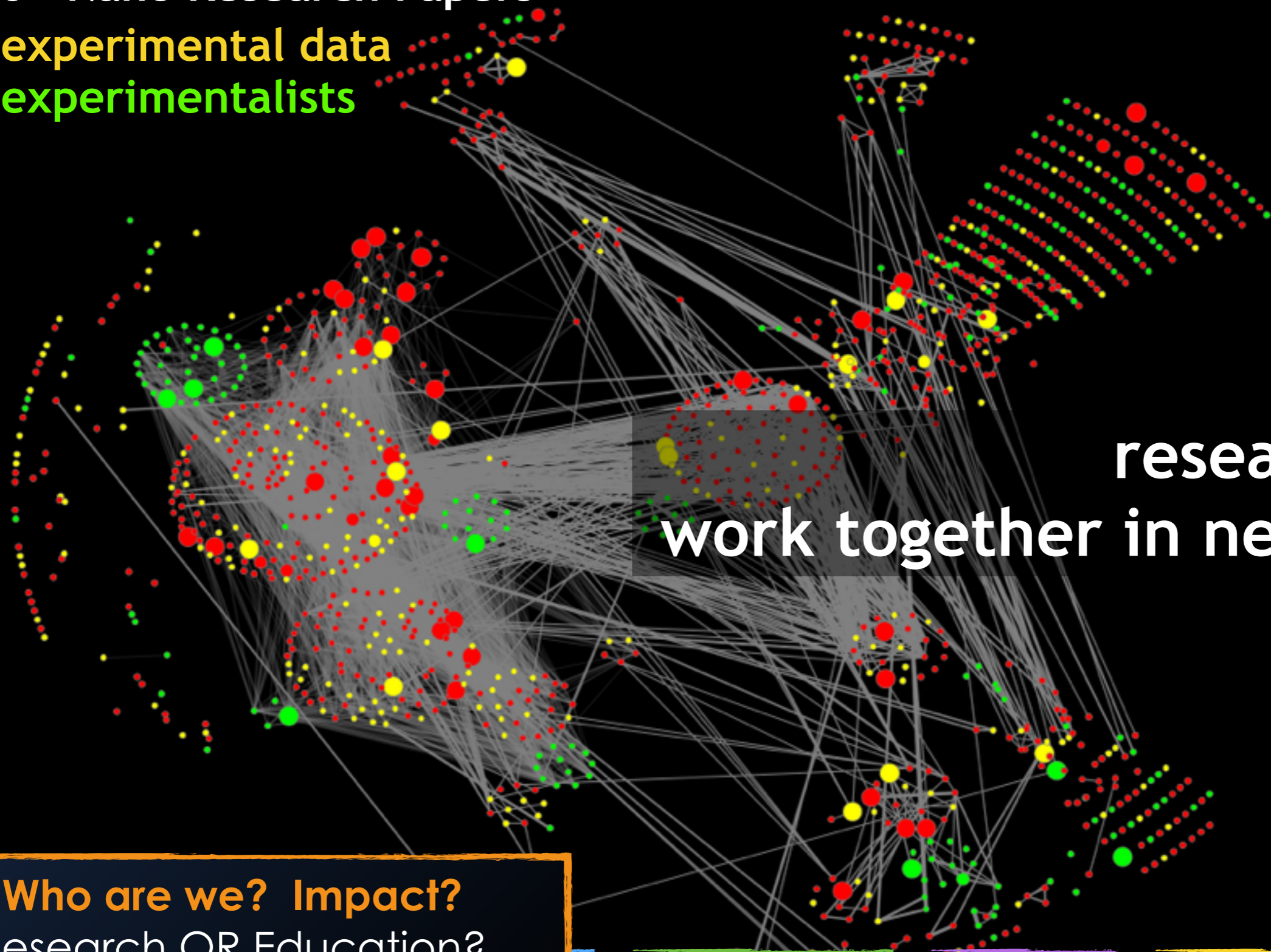


Experimentalist and Experimental Data (2000–2016)

1,300+ Nano Research Papers

40% experimental data

17% experimentalists



researchers,
work together in new ways

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Extinction, Scattering and Absorption efficiencies of multilayer nanoparticles

By [Bala Krishna Juluri](#), [Jun Huang](#), [Lasse Jensen](#)

Pennsylvania State University


Calculates the extinction, scattering, and absorption efficiencies of single nanoparticle (1 layer), core-shell Nanoparticle (2 layer) and nanomatryushka nanoparticle (3 layer)

Sponsored by Penn State Center for Nanoscale Science (MRSEC)

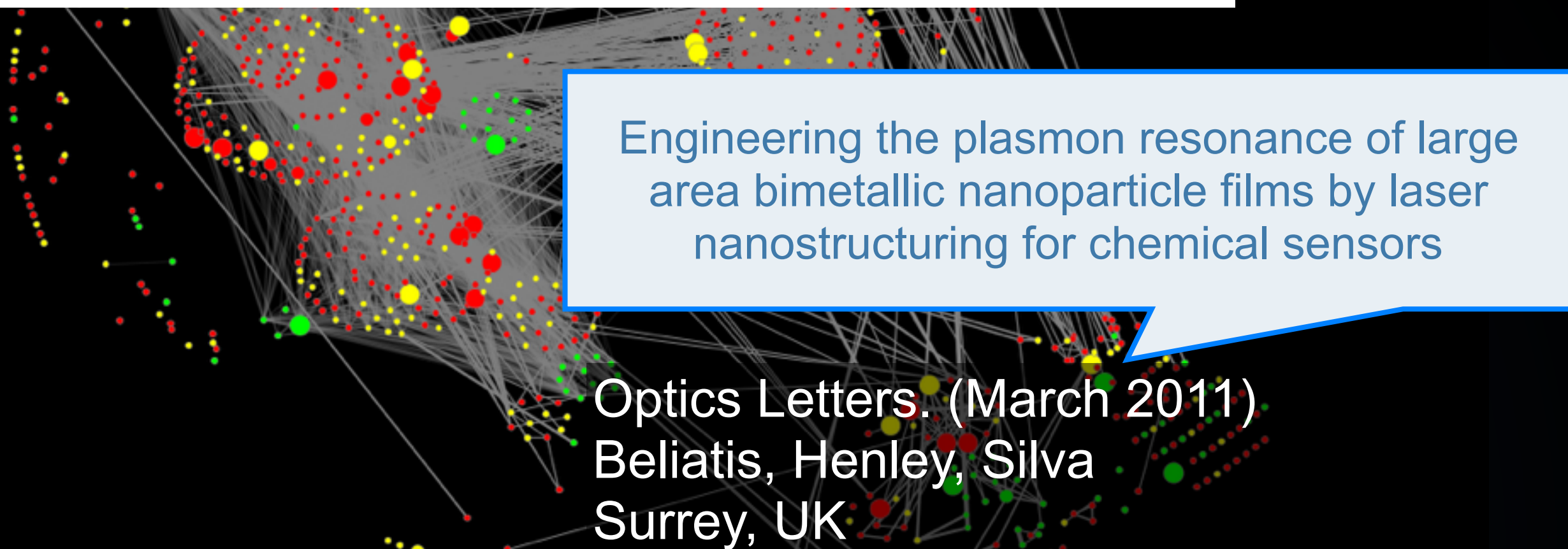
Launch Tool

Version 1.01 - published on 29 Apr 2010

[doi:10254/nanohub-r8228.2](https://doi.org/10.2554/nanohub-r8228.2) [cite this](#)

 This tool is closed source.

[View All Supporting Documents](#)



Engineering the plasmon resonance of large area bimetallic nanoparticle films by laser nanostructuring for chemical sensors

Optics Letters. (March 2011)
Beliatis, Henley, Silva
Surrey, UK

Received July 23, 2010; revised March 2, 2011; accepted March 15, 2011; posted March 23, 2011 (Doc. ID 132119); published April 7, 2011

Experimentalist and Experimental Data (2000–2016)

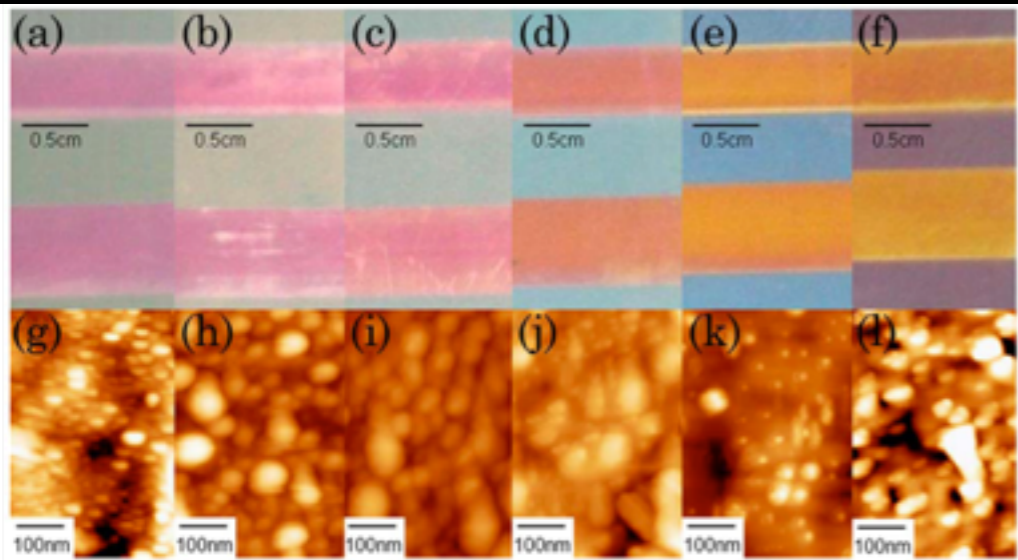


Fig. 1. (Color online) (a) Ag_0Au_5 , (b) Ag_1Au_4 , (c) Ag_2Au_3 , (d) Ag_3Au_2 , (e) Ag_4Au_1 , and (f) Ag_5Au_0 alloy nanoparticles fabricated using the laser nanostructuring process and (g) –(l) their AFM characterization.

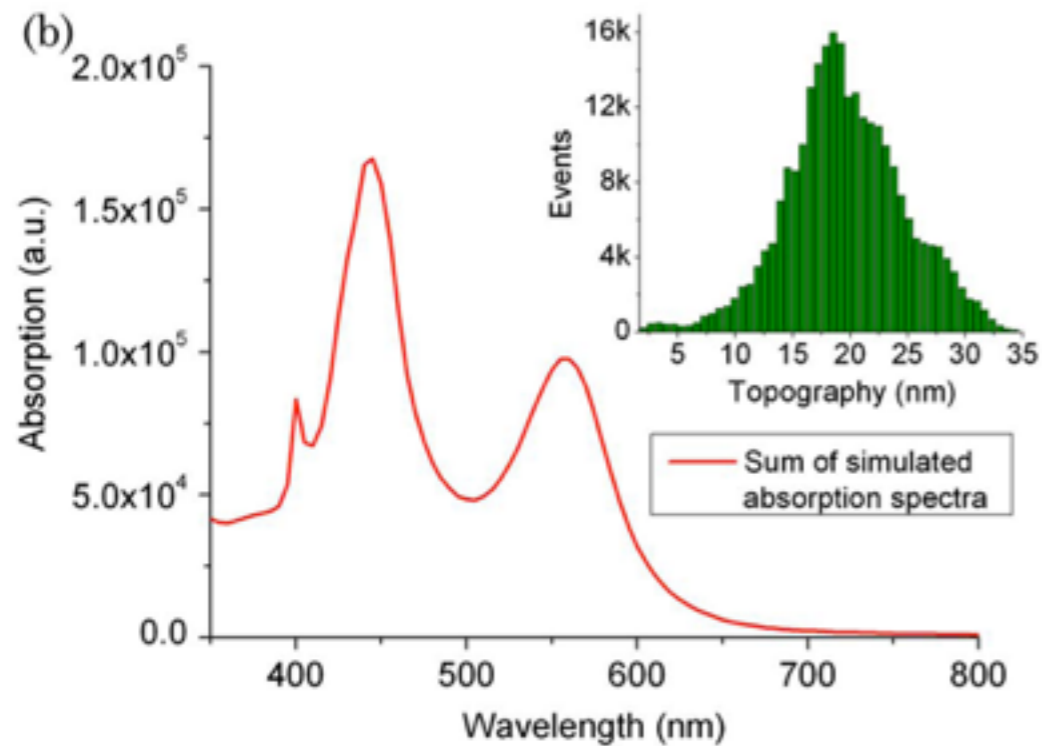
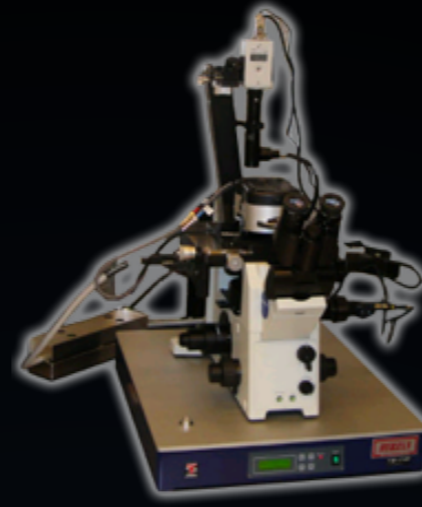
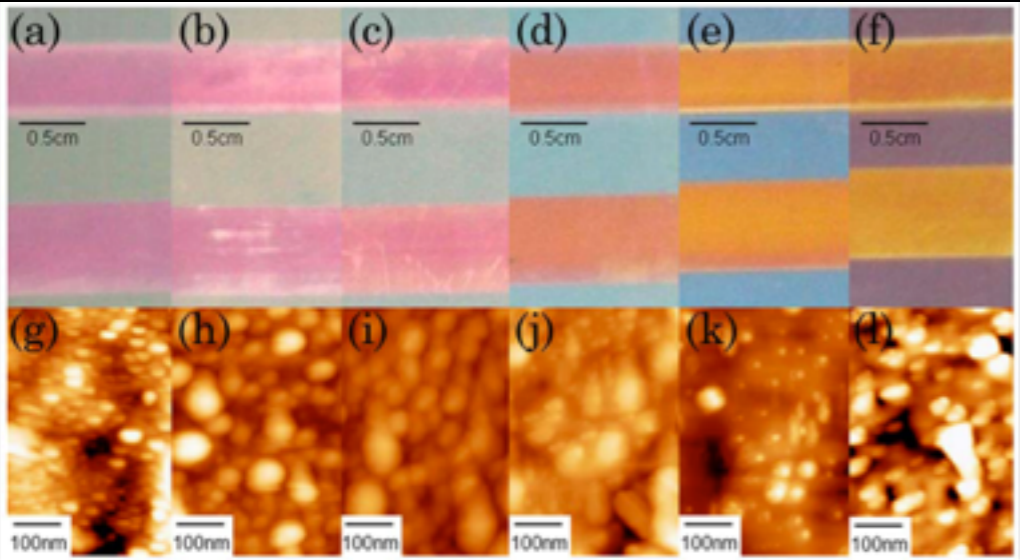


Fig. 2. (Color online) (a) Optical absorption spectrum obtained from the MNFs Ag_5Au_0 (i), Ag_4Au_1 (ii), Ag_3Au_2 (iii), Ag_2Au_3 (iv), Ag_1Au_4 (v), and Ag_0Au_5 (vi); (b) the statistically approximated absorption for the Ag_3Au_2 film. The AFM characterization is shown in the inset.

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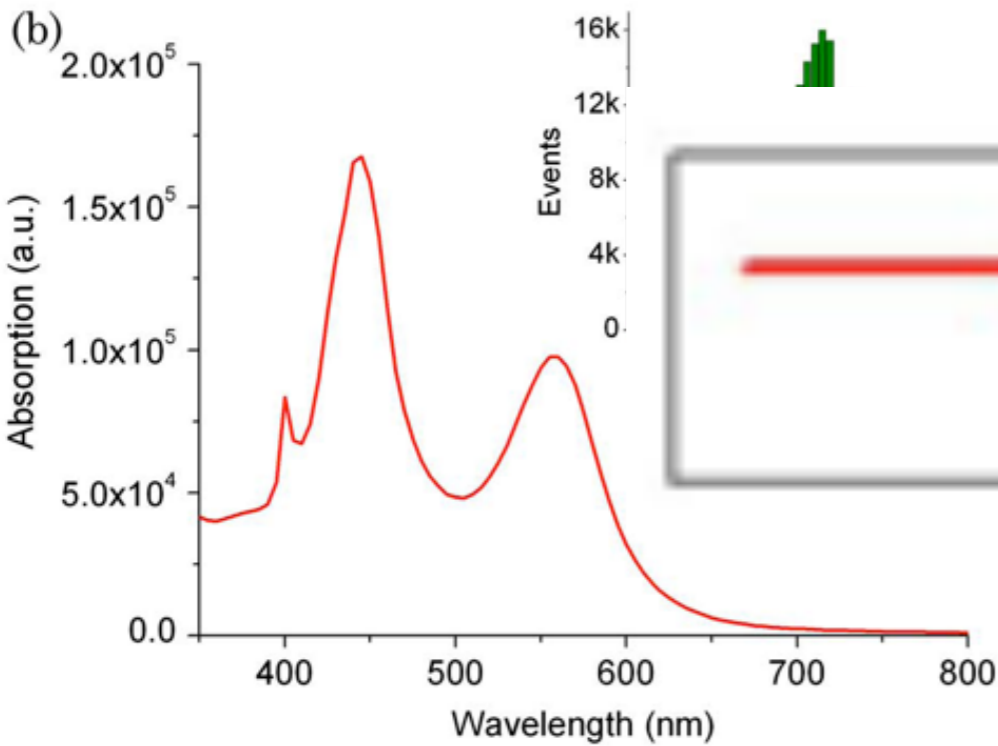
Received July 23, 2010; revised March 2, 2011; accepted March 15, 2011; posted March 23, 2011 (Doc. ID 132119); published April 7, 2011



data has inherent uncertainties

experimentalists
ran tool hundreds of times

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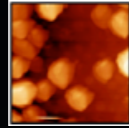
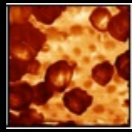
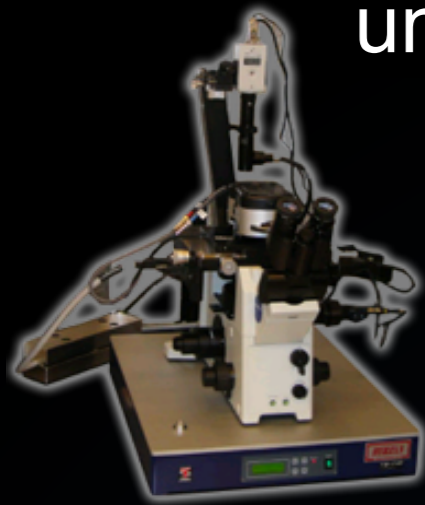


— Sum of simulated absorption spectra

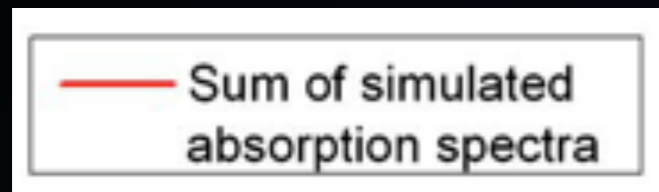
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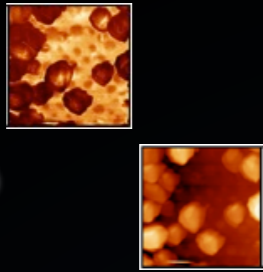
More than averaging runs!



Uncertainty Quantification



data has inherent
uncertainties

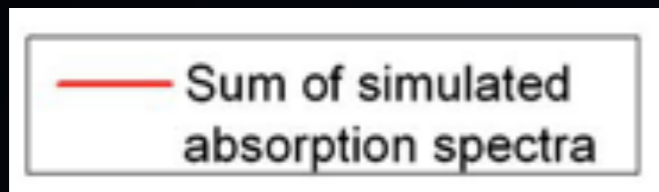


2012

**Proposal
Vision**

Culture Change
Sustainability

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More than averaging runs!



Uncertainty Quantification

Innovations

Web Delivery

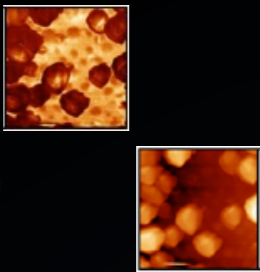
Visualization

Analytics

UQ

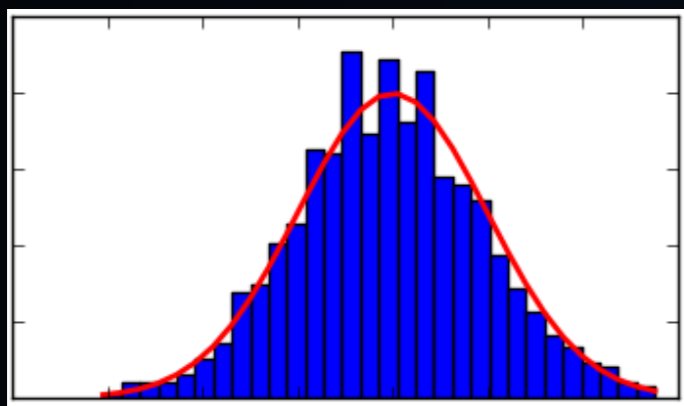


data has inherent uncertainties



experimentalists ran tool hundreds of times

— Sum of simulated absorption spectra



New in 2016
UQ in Rappture Tools

Extinction, Scattering and Absorption efficiencies of single and multilayer nanoparticles

⚙️ Terminate ➡ Keep for later

1 Model and Parameters → 2 Materials and Radius Ratio → 3 Simulate

1-Layer Nanoparticle 2-Layer Nanoparticle 3-Layer Nanoparticle

Model/Number of Layers: One layer or only core

Initial Wavelength: 300nm

Final Wavelength: 800nm

Resolution: 5nm

Particle Radius (R): gaussian 12.5nm 7nm

Refractive index of medium: 1

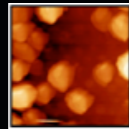
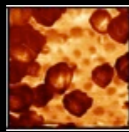
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Visualization
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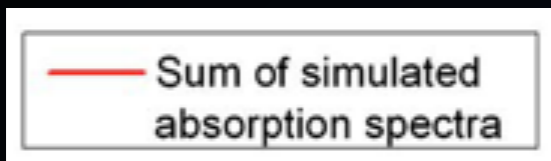
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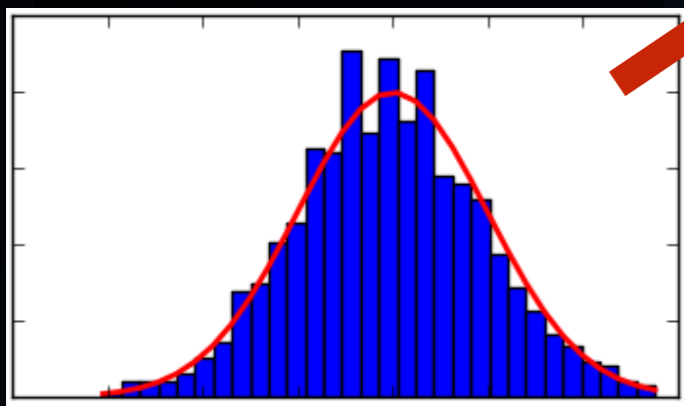
data has inherent uncertainties



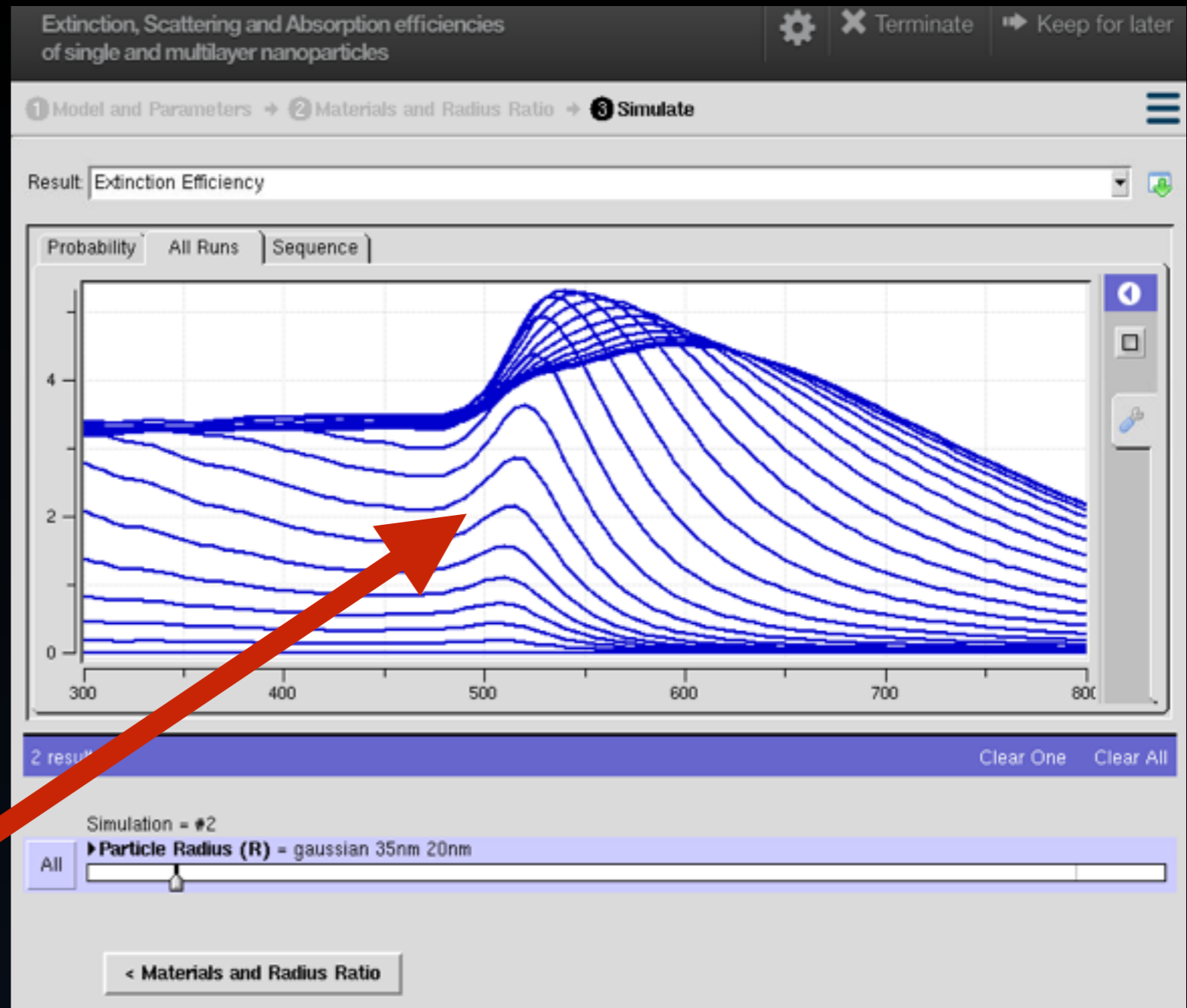
experimentalists ran tool hundreds of times



input distribution



New in 2016
UQ in Rappture Tools

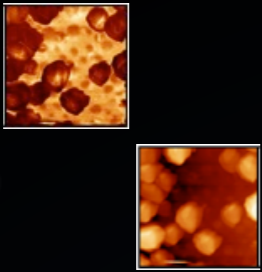


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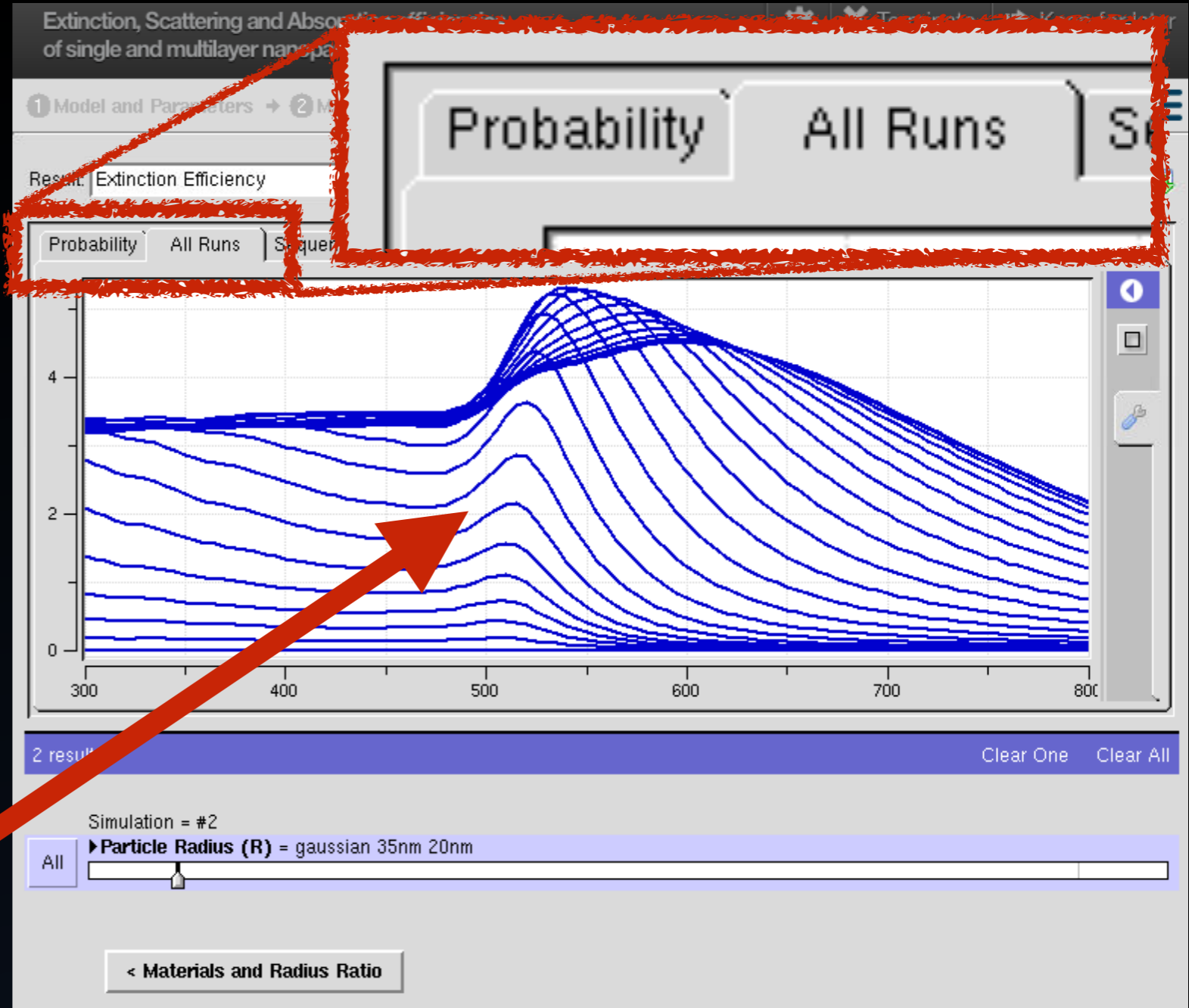
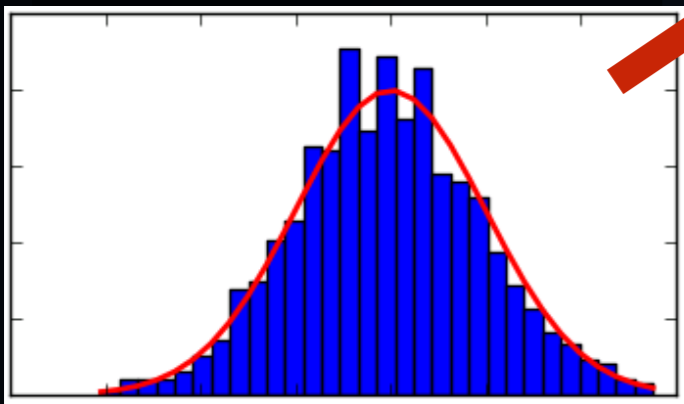
data has inherent uncertainties



experimentalists ran tool hundreds of times

— Sum of simulated absorption spectra

input distribution



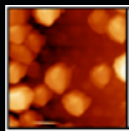
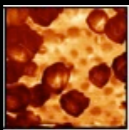
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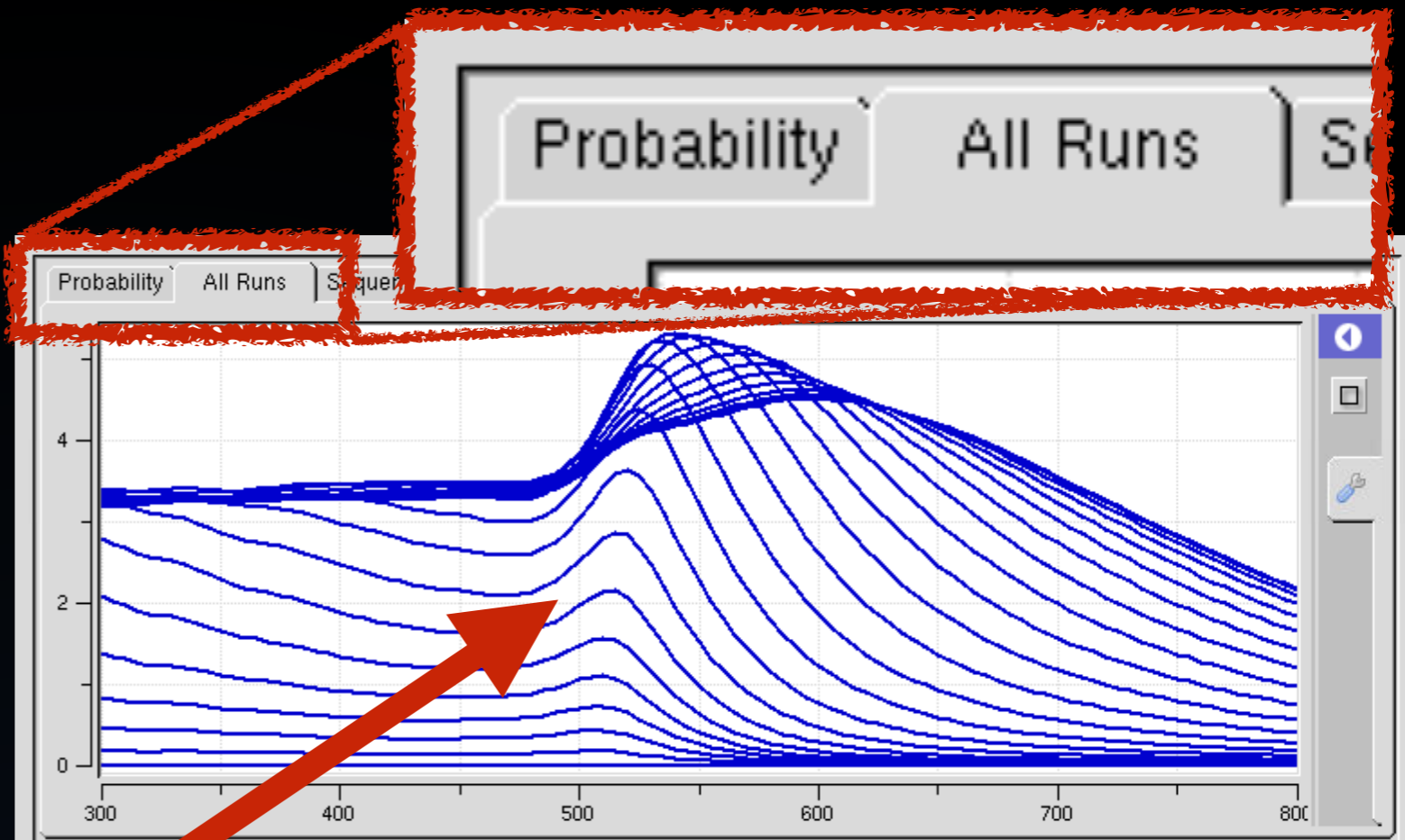
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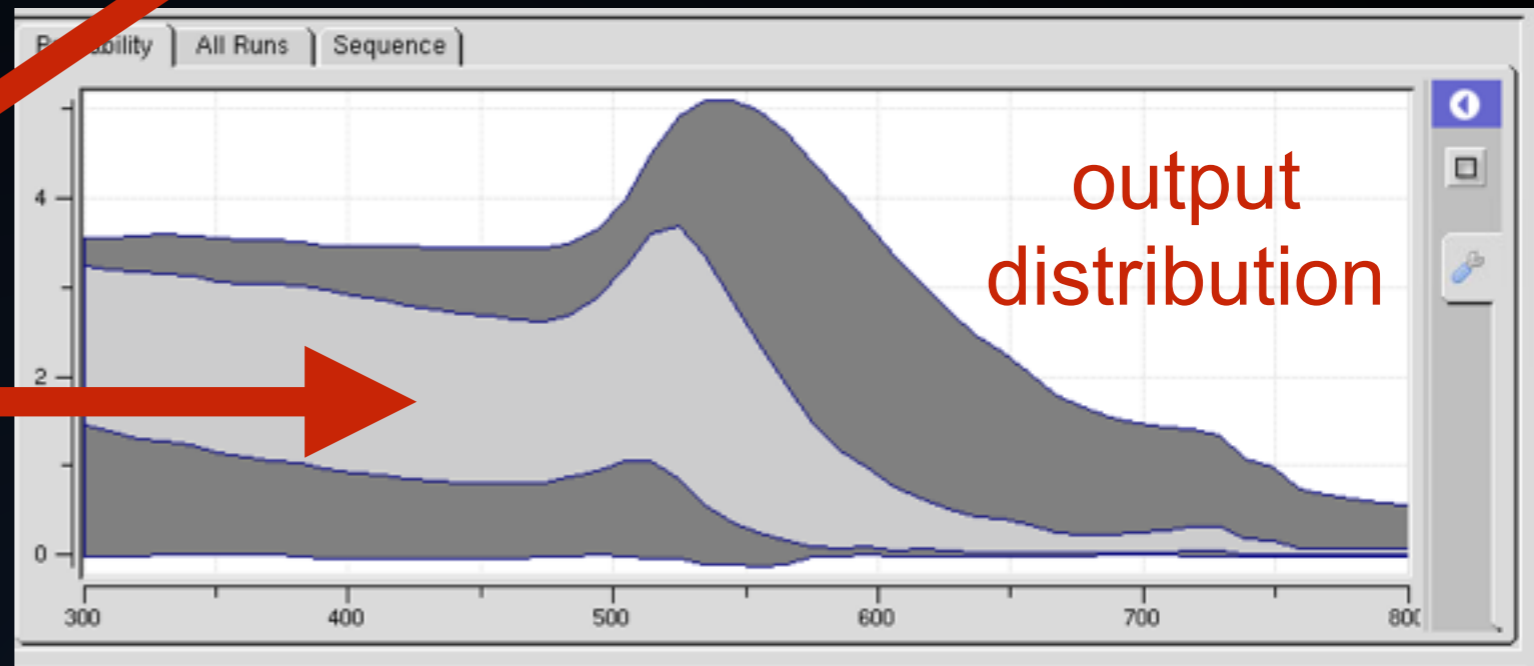
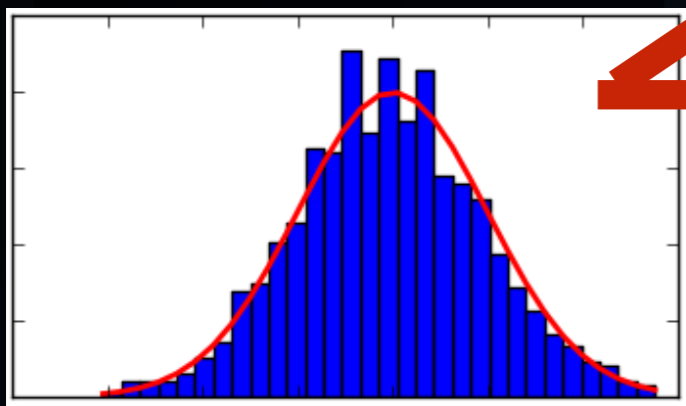


experimentalists ran tool hundreds of times



— Sum of simulated absorption spectra

input distribution



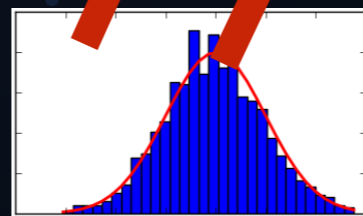
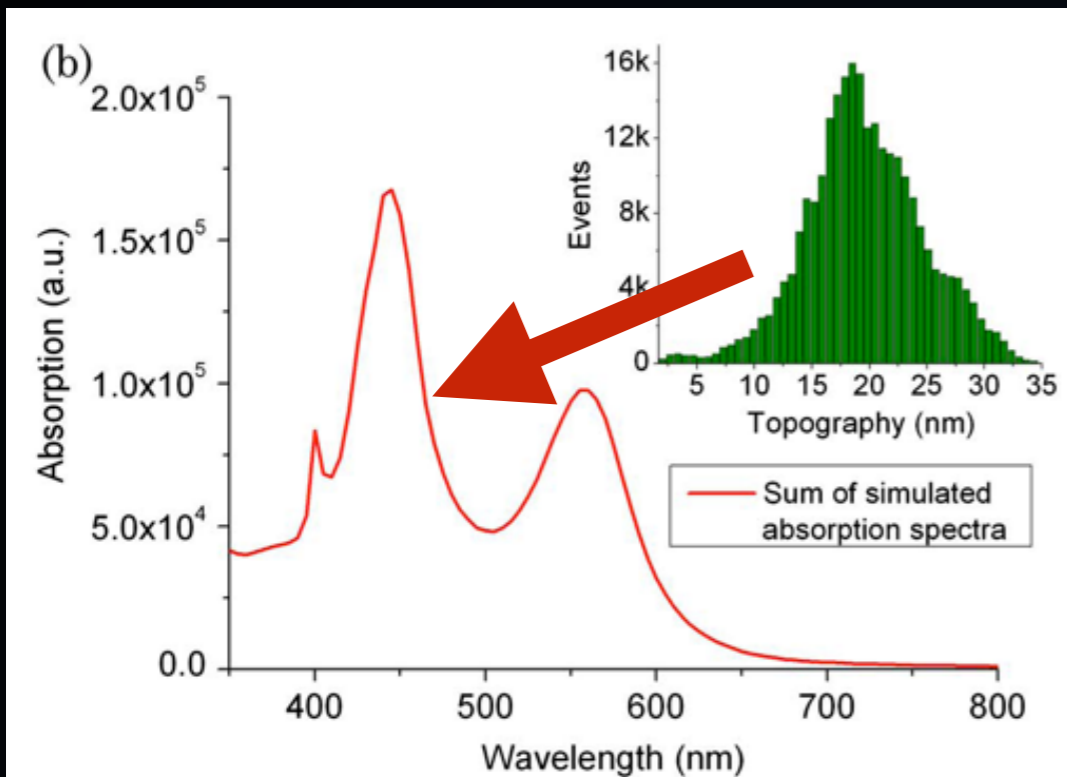
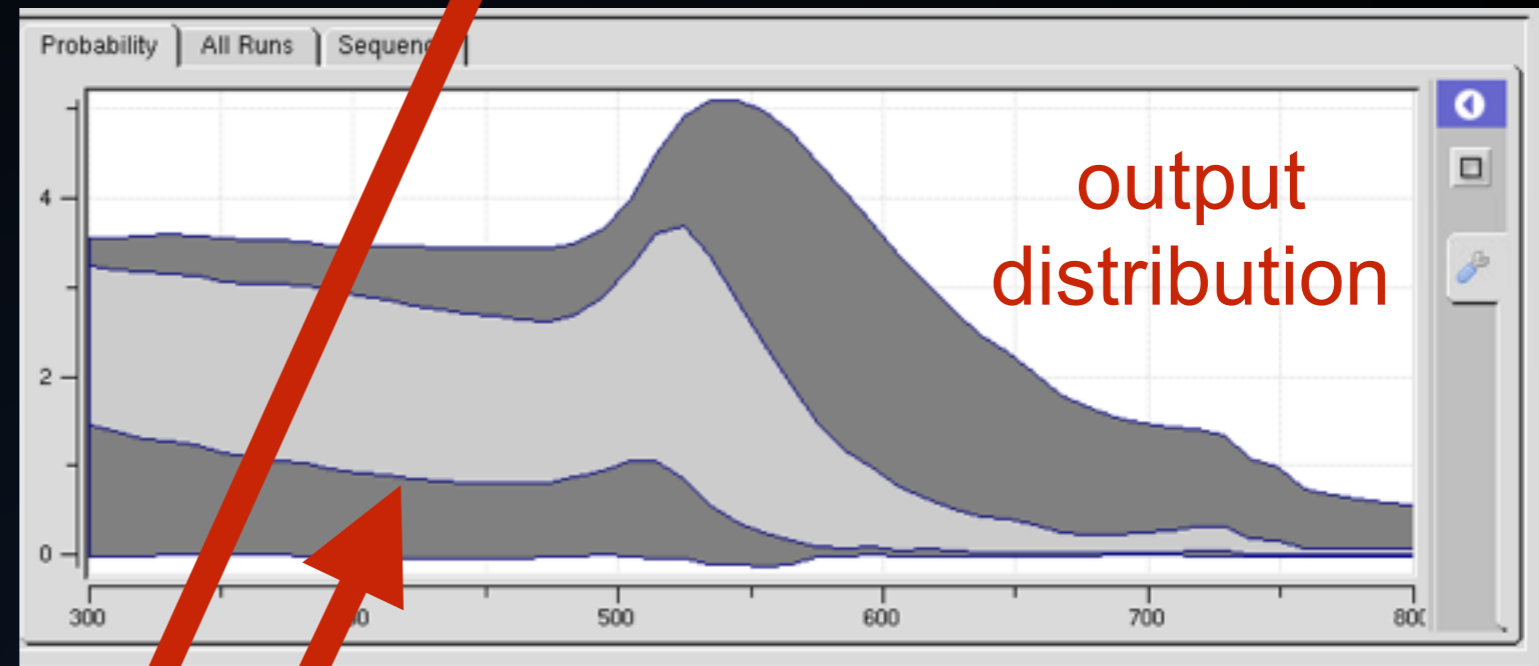
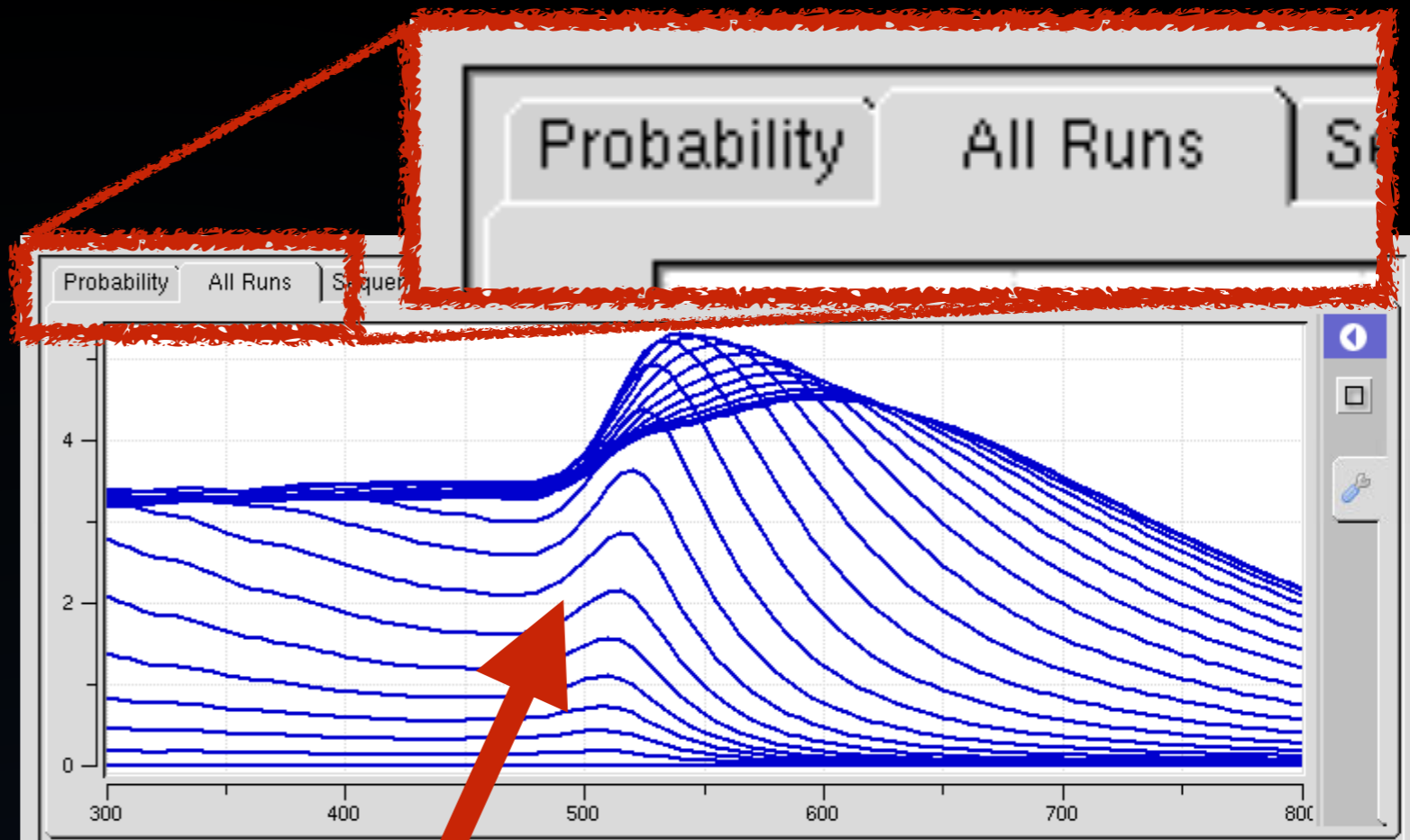
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New in 2016 UQ in Rappture Tools



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Launch Tool

Version 1.01 - published on 29 Apr 2010

doi:10254/nanohub-r8228.2 cite this

Received July 23, 2010;

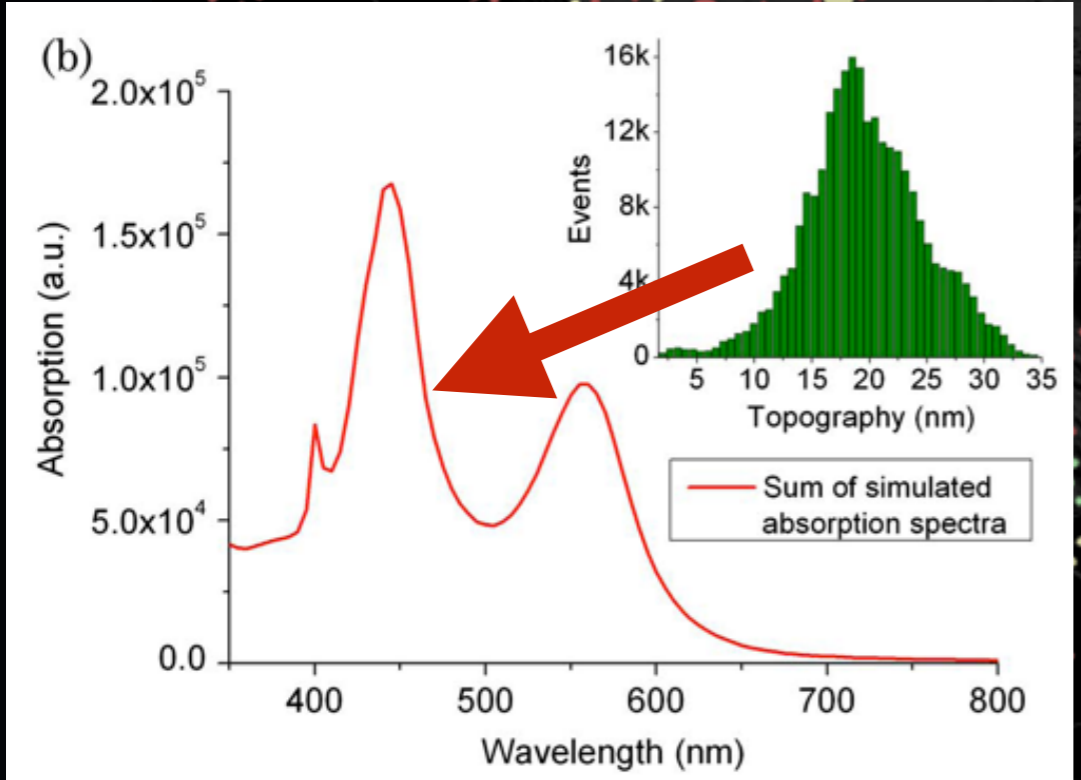


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Experimentalist and Exp. data
 index
 Papers with potential to influence h-index
 ● Non-Experimental
 ● Papers affecting the h-index





Launch Tool

Version 1.01 - published on 29 Apr 2010

doi:10254/nanohub-r8228.2 [cite this](#)

**tool created without
NCN involvement**



3 months

Received July 23, 2010;

Received 30th December 2012,

Received 29 September 2013,

Received: 6 May 2014

Received 11 September 2014

Received: October 17, 2015

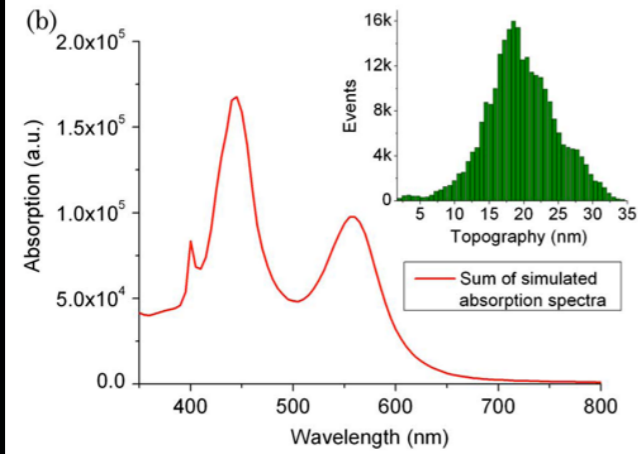
tool use in research

**5 more articles
4 different groups**

**ALL
experimental**

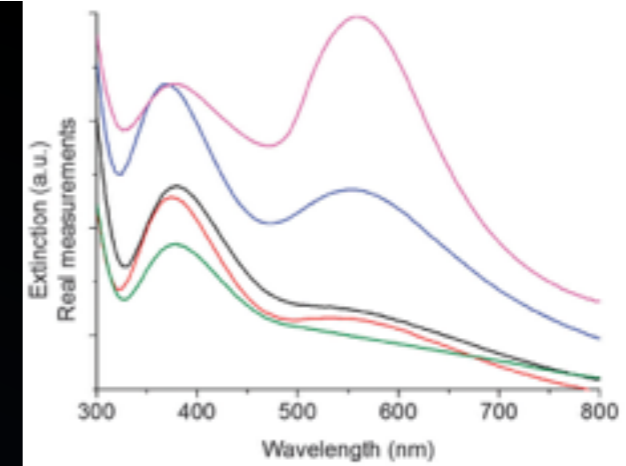
nanoHUB has become a Publisher!

Received July 23, 2010;

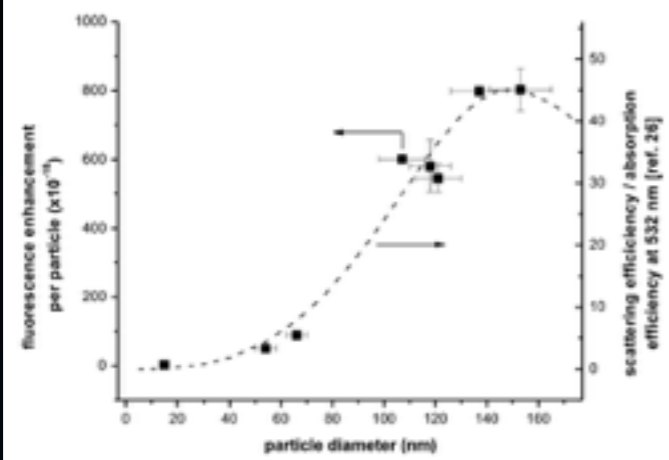


ALL experimental ALL show distributions

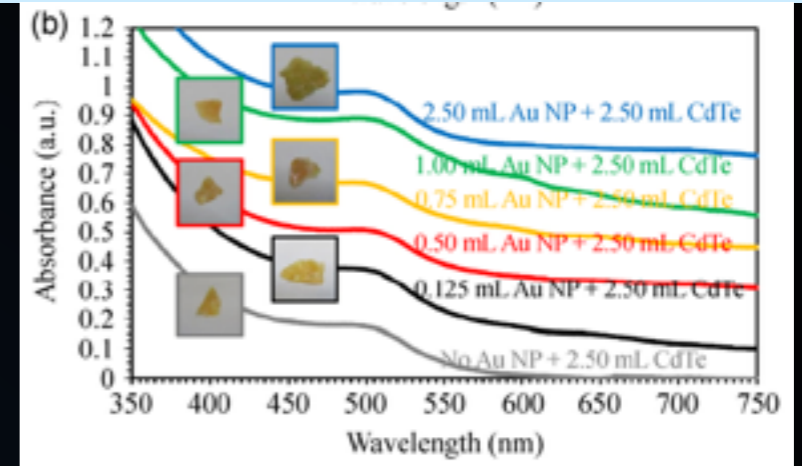
Received 30th December 2012,



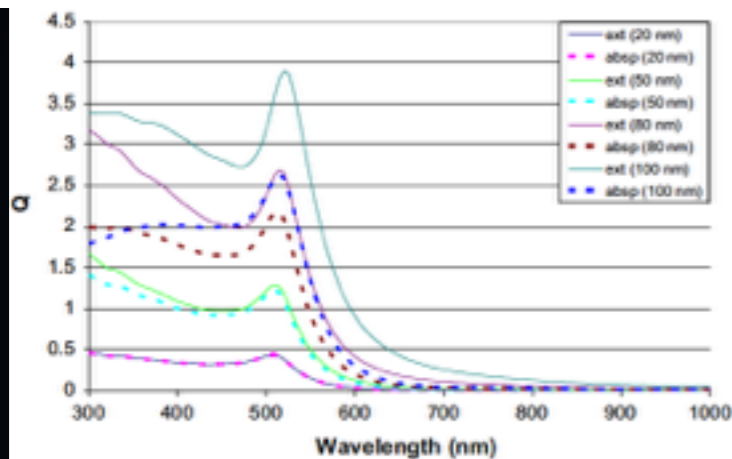
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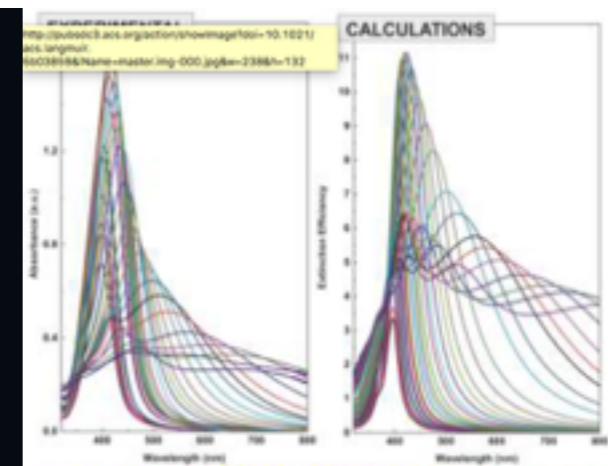
Received: 6 May 2014



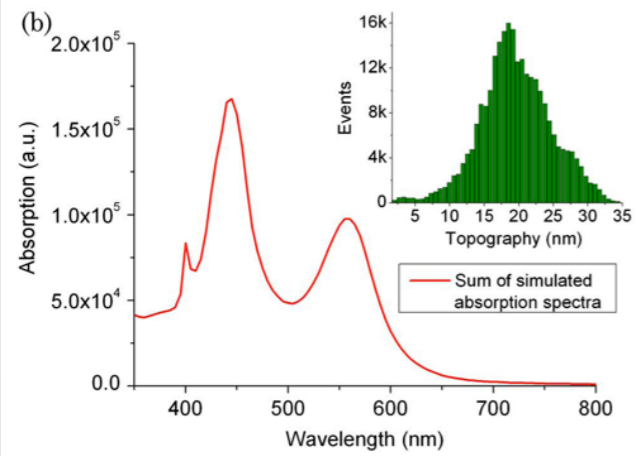
Received 11 September 2014



Received: October 17, 2015

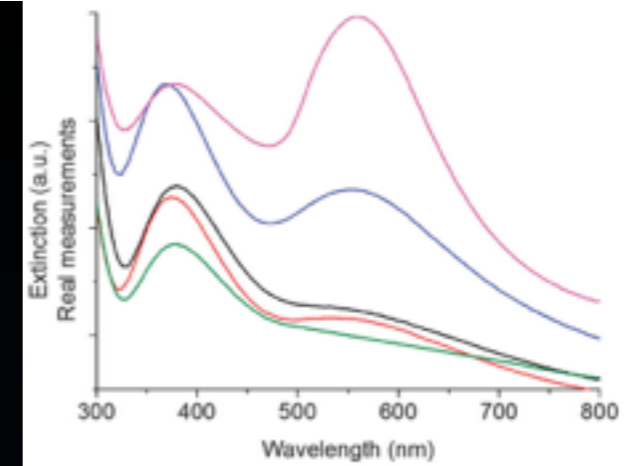


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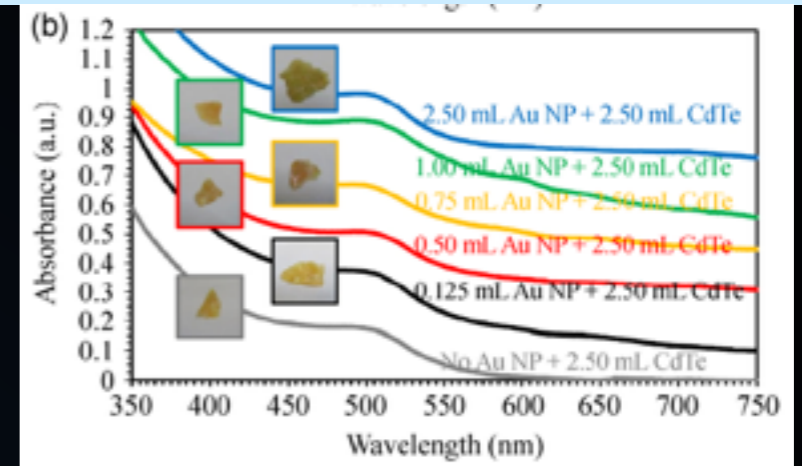


ALL experimental
ALL show distributions

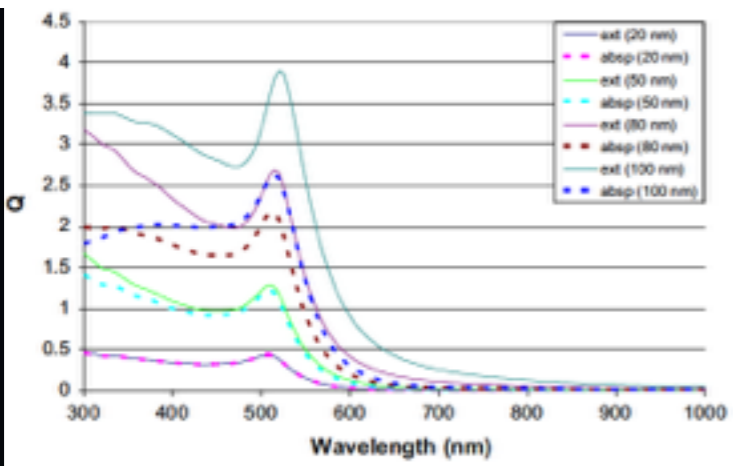
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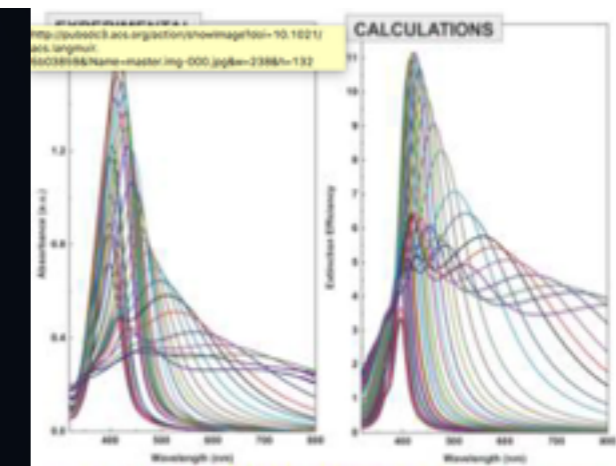
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Received 11 September 2014

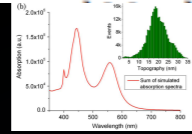


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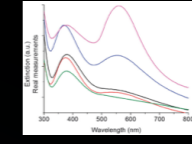


ALL experimental ALL show distributions

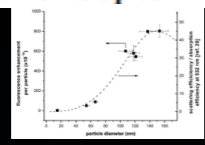
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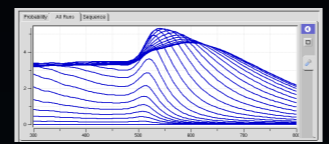
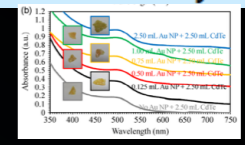
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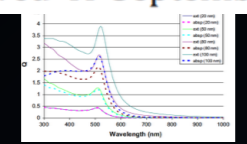
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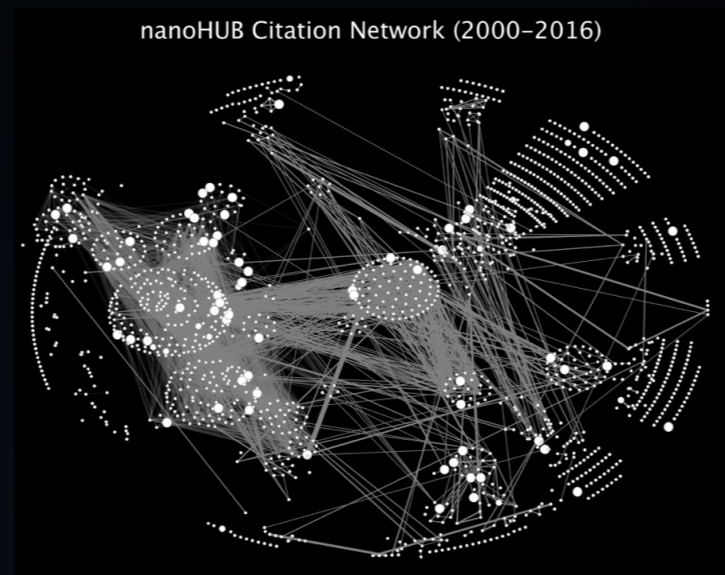
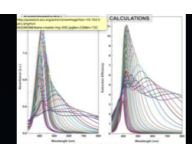
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Received: October 17, 2015

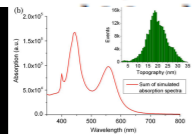


Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?

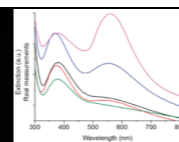


ALL experimental ALL show distributions

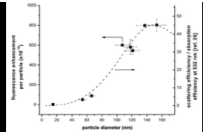
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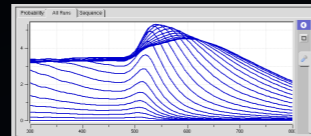
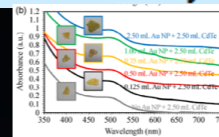
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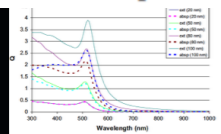


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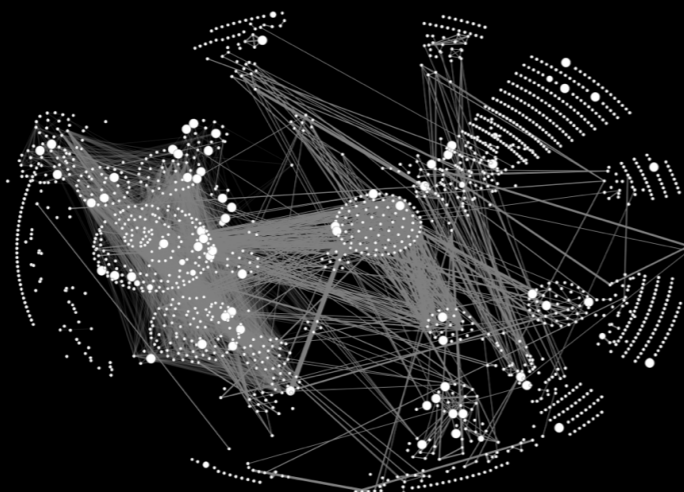


**Proposal
Vision**
Culture Change
Sustainability

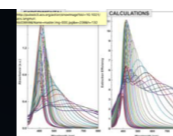
Received 11 September 2014



nanoHUB Citation Network (2000–2016)



Received: October 17, 2015



Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?



1,550+ Papers => researchers,
work together in new ways



Who are we? Impact?

Research OR Education?

Research? Good Research?

Classroom usage?



nanoHUB Citation Network (2000–2016)

1,550+ Papers

19,000+ secondary citations

Research Quality



Who are we? Impact?

Research OR Education?

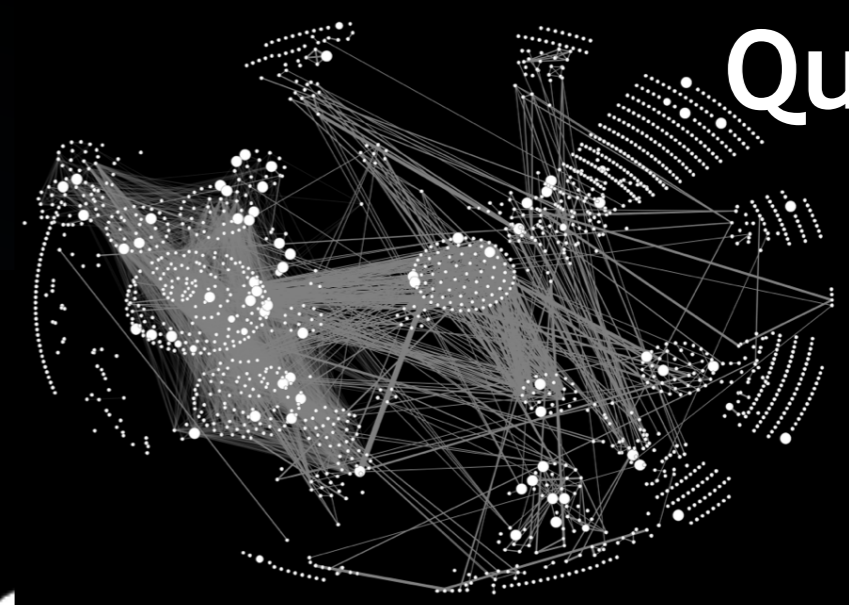
Research? **Good Research?**

Classroom usage?



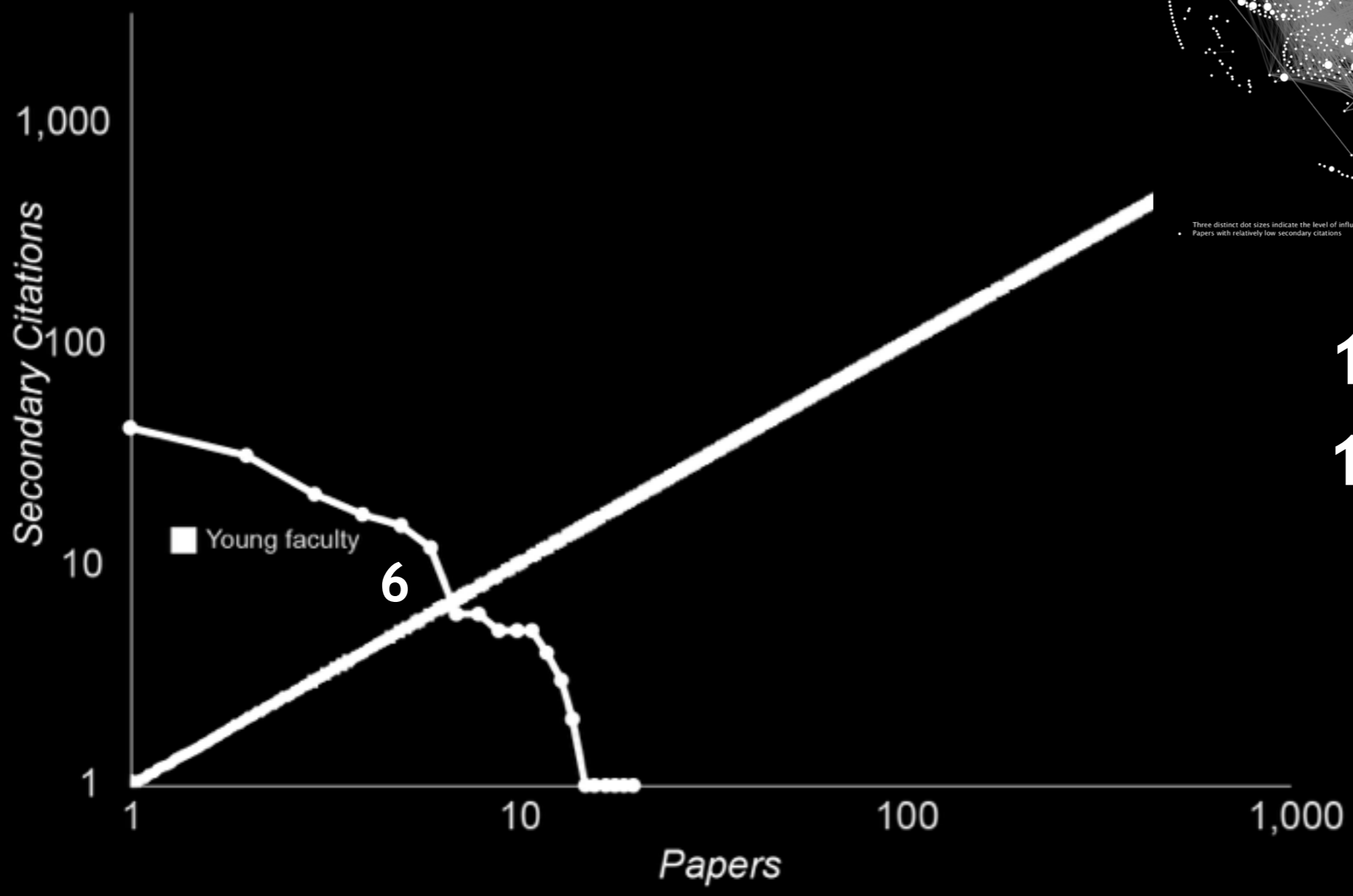
Research Quality

nanoHUB Citation Network (2000-2016)



Three distinct dot sizes indicate the level of influence on h-index
 • Papers with relatively low secondary citations • Papers with potential to influence h-index • Papers affecting the h-index

Junior Faculty Member: 20-30 Papers
 100+ secondary citations h-index 6



1,550+ Papers
19,000+ secondary citations

Who are we? Impact?
 Research OR Education?
 Research? **Good Research?**
 Classroom usage?

Strategies?
 Opportunity driven?
 Networking, Diversity
 Sustainability

nanoHUB scalable?
 Cycles? Support?
 Developers?
 Incentives?

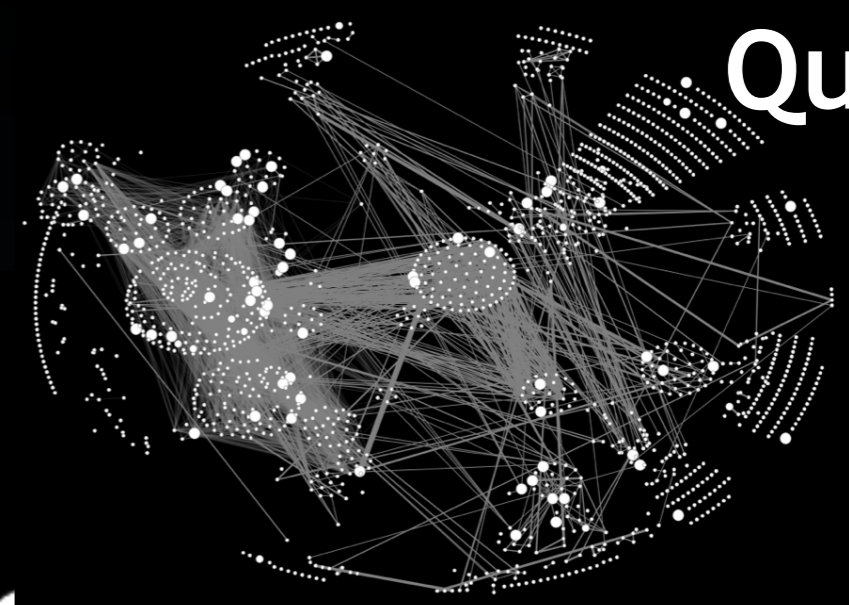
Innovations
 Web Delivery
 Visualization
 Analytics, UQ

Proposal
 Vision
 Culture Change
 Sustainability



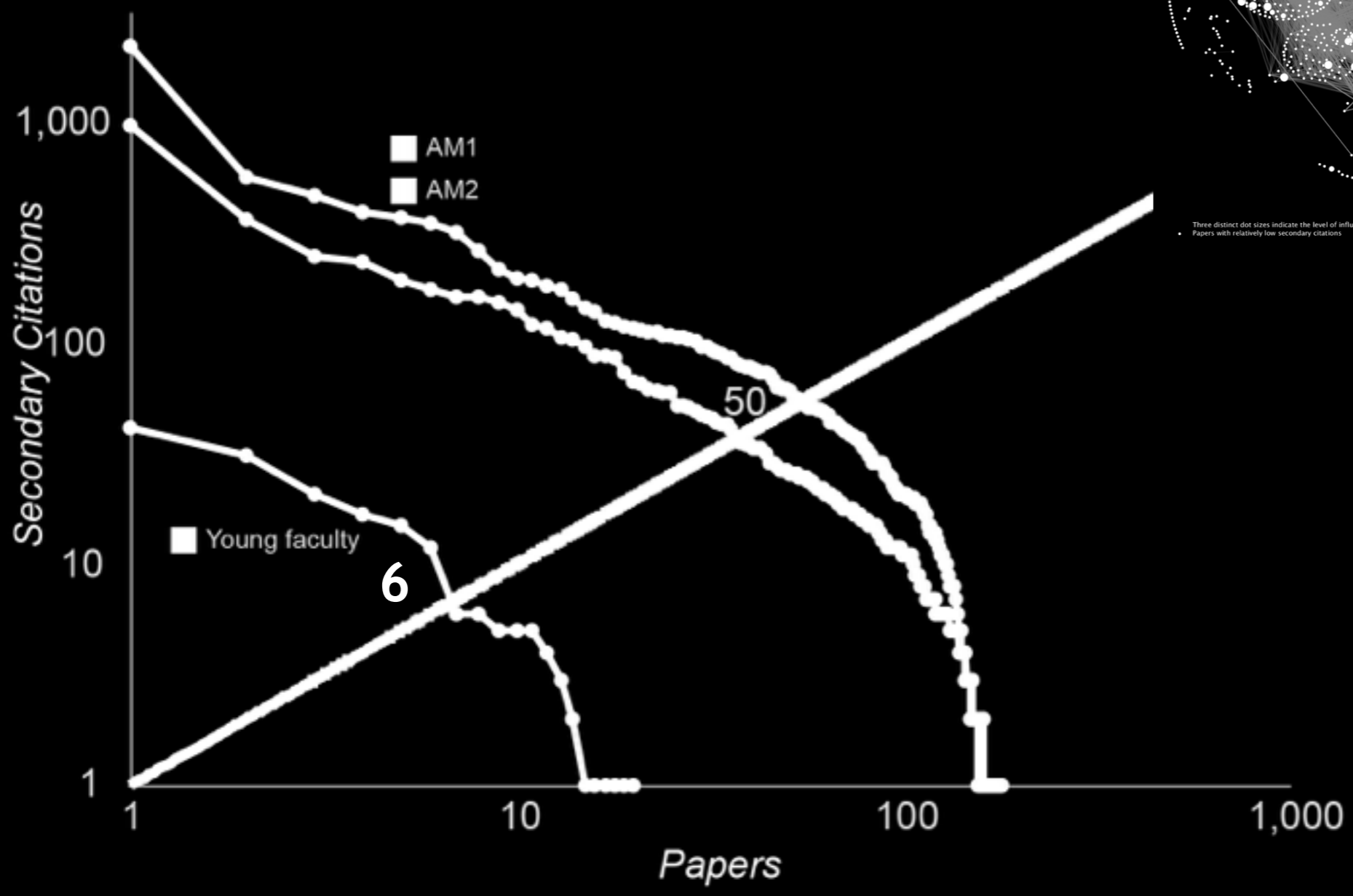
Research Quality

nanoHUB Citation Network (2000-2016)



Three distinct dot sizes indicate the level of influence on h-index
 • Papers with relatively low secondary citations • Papers with potential to influence h-index • Papers affecting the h-index

Members of Academy: 200+ Papers
 7,000+ secondary citations h-index ~50



Who are we? Impact?
 Research OR Education?
 Research? **Good Research?**
 Classroom usage?

Strategies?
 Opportunity driven?
 Getting, Diversity
 Sustainability

nanoHUB scalable?
 Cycles? Support?
 Developers?
 Incentives?

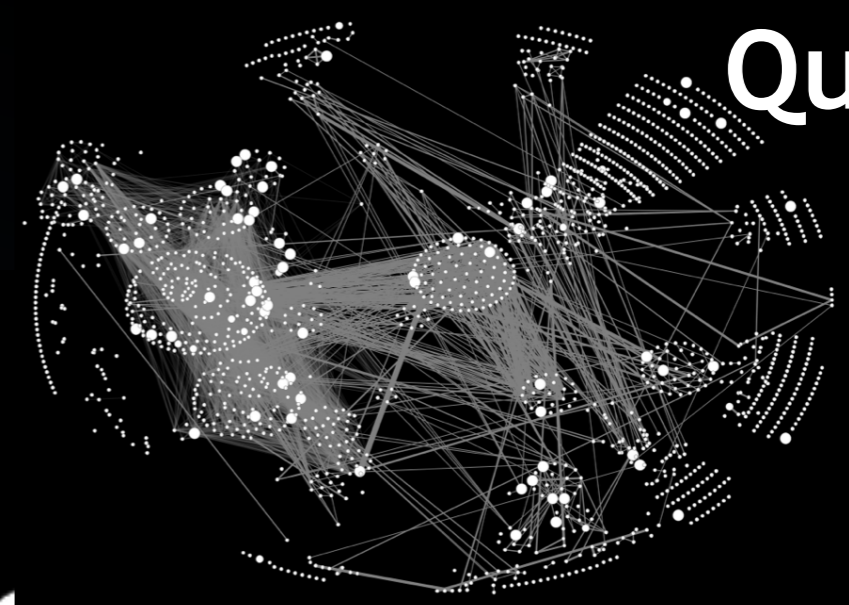
Innovations
 Web Delivery
 Visualization
 Analytics, UQ

Proposal
 Vision
 Culture Change
 Sustainability



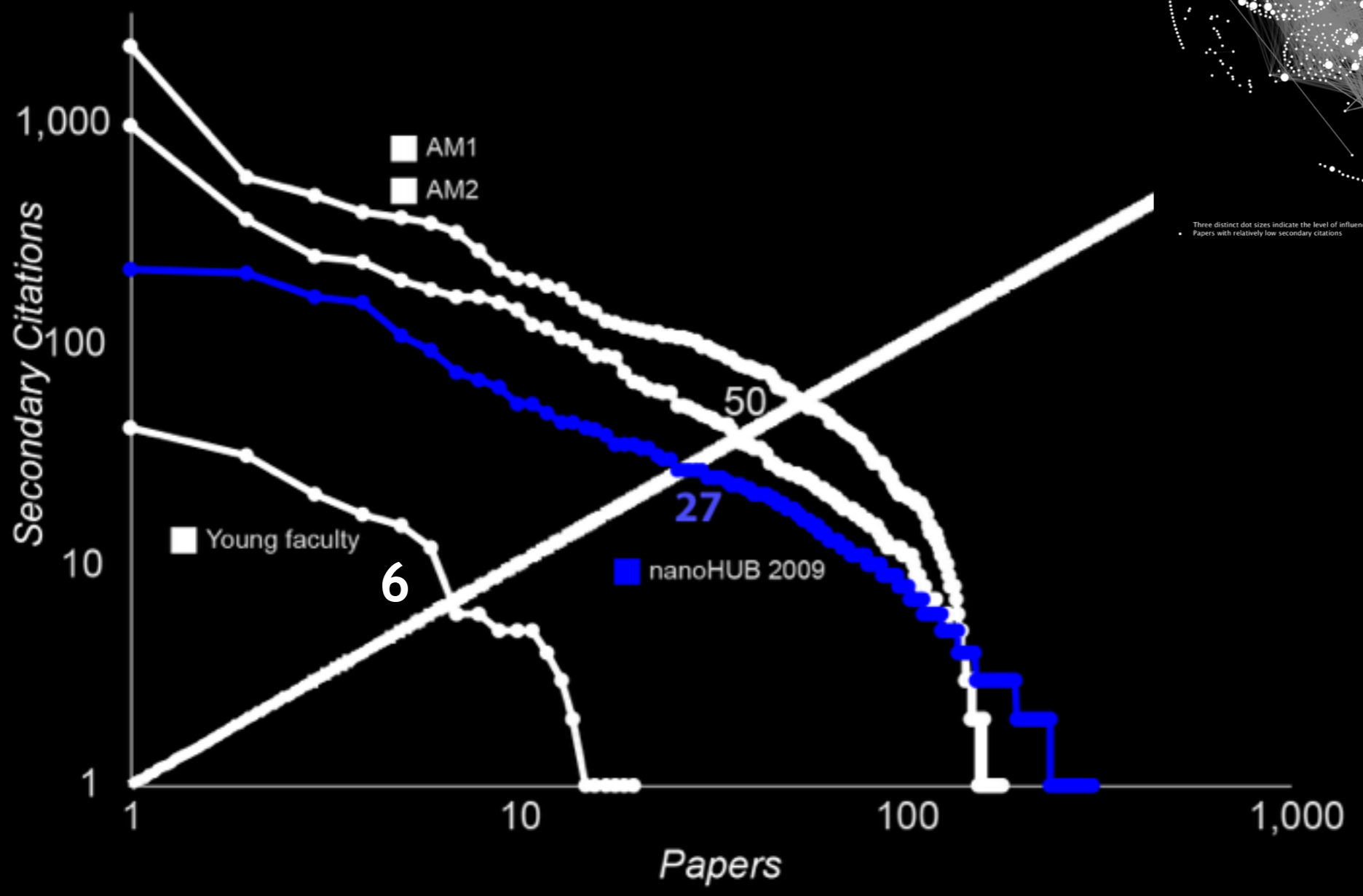
Research Quality

nanoHUB Citation Network (2000-2016)



Three distinct dot sizes indicate the level of influence on h-index
 • Papers with relatively low secondary citations
 • Papers with potential to influence h-index
 • Papers affecting the h-index

nanoHUB 2009: 575 Papers
 3,200+ secondary citations h-index 27



Who are we? Impact?
 Research OR Education?
 Research? **Good Research?**
 Classroom usage?

Strategies?
 Opportunity driven?
 Getting, Diversity
 Sustainability

nanoHUB scalable?
 Cycles? Support?
 Developers?
 Incentives?

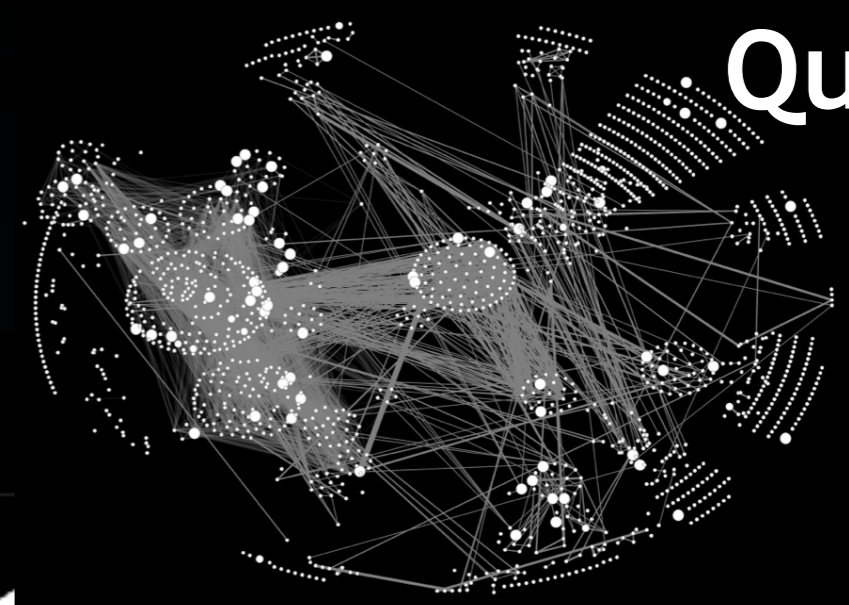
Innovations
 Web Delivery
 Visualization
 Analytics, UQ

Proposal
 Vision
 Culture Change
 Sustainability



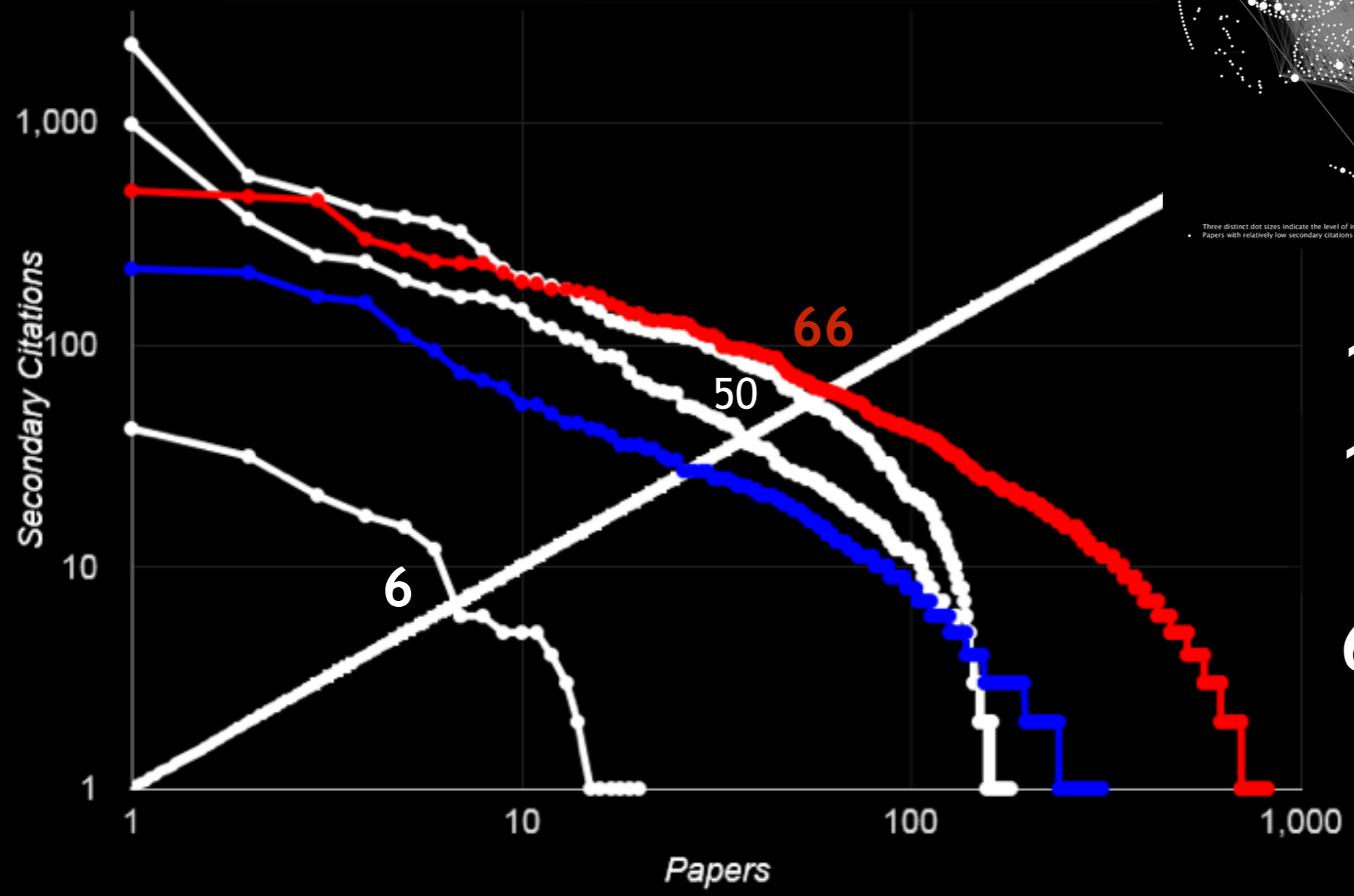
Research Quality

nanoHUB Citation Network (2000-2016)



Three distinct dot sizes indicate the level of influence on h-index
 • Papers with relatively low secondary citations • Papers with potential to influence h-index • Papers affecting the h-index

nanoHUB 2016: 1,550+ Papers
19,000+ secondary citations h-index 66



1,550+ Papers
19,000+ secondary citations
66 h-index

Who are we? Impact?
 Research OR Education?
 Research? **Good Research?**
 Classroom usage?

Strategies?
 Opportunity driven?
 Getting, Diversity
 Sustainability

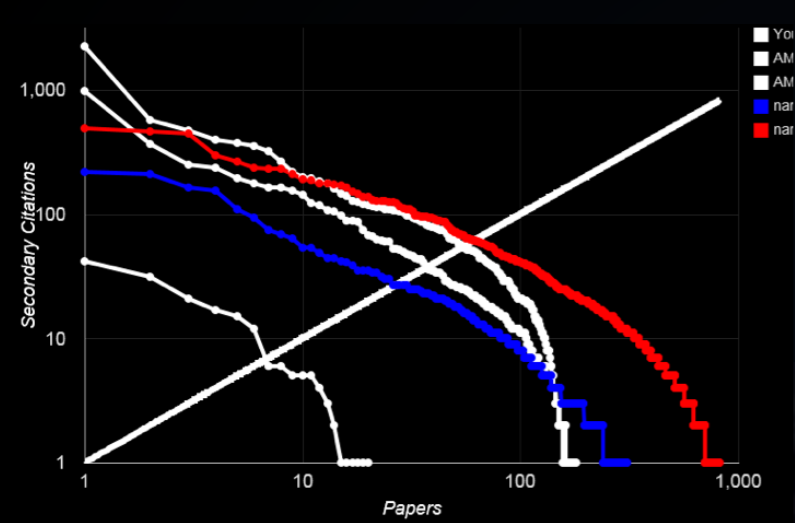
nanoHUB scalable?
 Cycles? Support?
 Developers?
 Incentives?

Innovations
 Web Delivery
 Visualization
 Analytics, UQ

Proposal
 Vision
 Culture Change
 Sustainability



Vision



nanoHUB Citation Network (2000-2016)



to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways

Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?

Strategies?

Opportunity driven?
Goal setting, Diversity
Sustainability

nanoHUB scalable?

Cycles? Support?
Developers?
Incentives?

Innovations

Web Delivery
Visualization
Analytics, UQ

Proposal

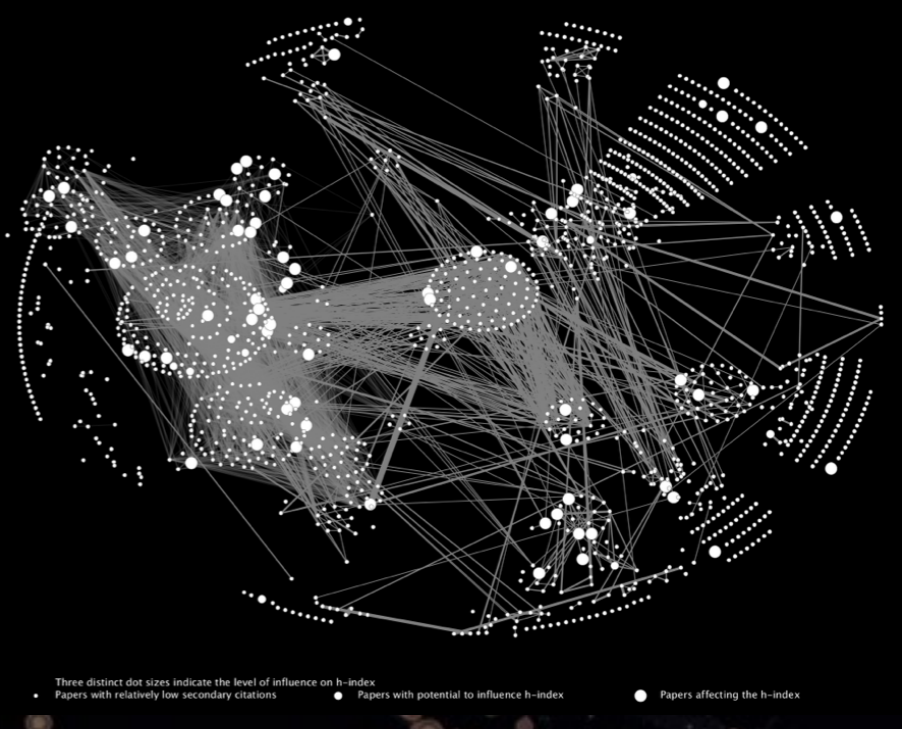
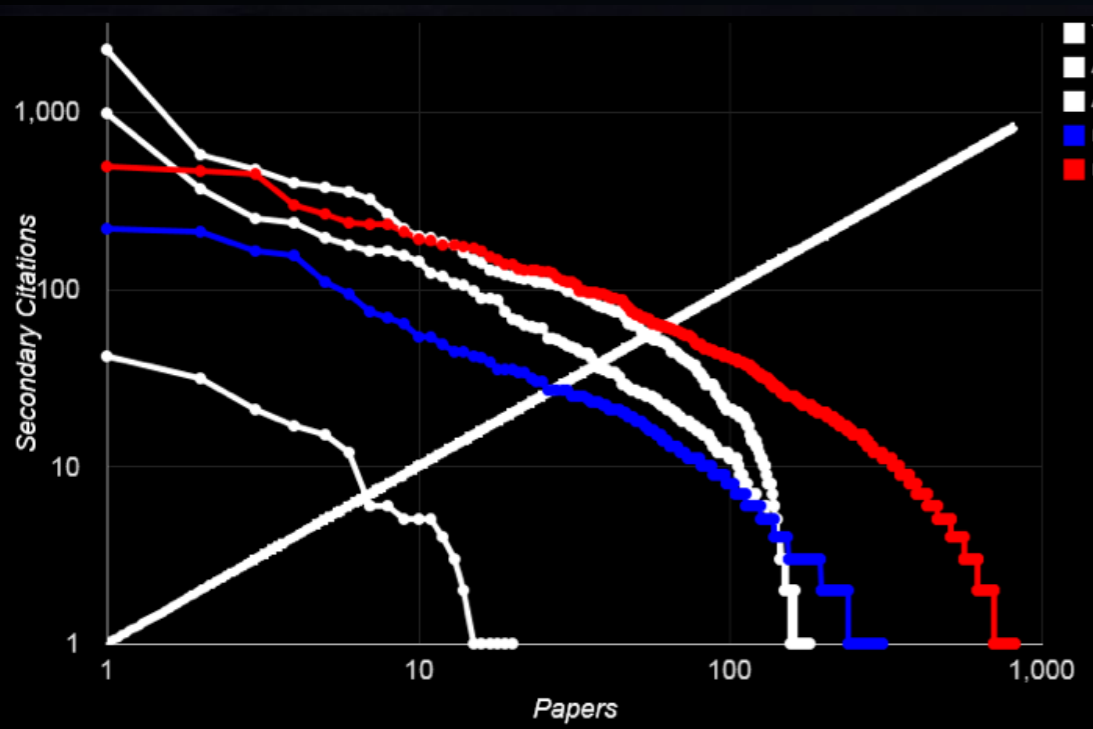
Vision
Culture Change
Sustainability



Vision to Operation

no more flights to Japan needed

nanoHUB Citation Network (2000-2016)



Semi-automatic web-based citation search and management, pipeline for student review

nanoHUB scalable?
Cycles? **Support?**
Developers?
Incentives?

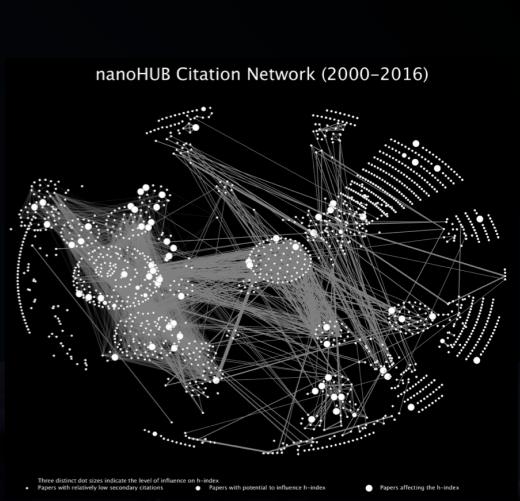
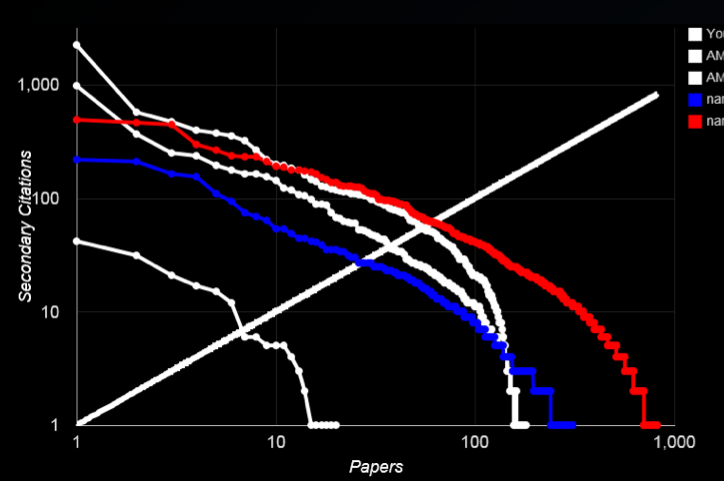
Strategies?
Community driven?
Innovation, Diversity
Sustainability



Innovations
Web Delivery
Visualization
Analytics, UQ



Reproducibility Culture Change



to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways



Proposal
Vision
Culture Change
Sustainability

Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?

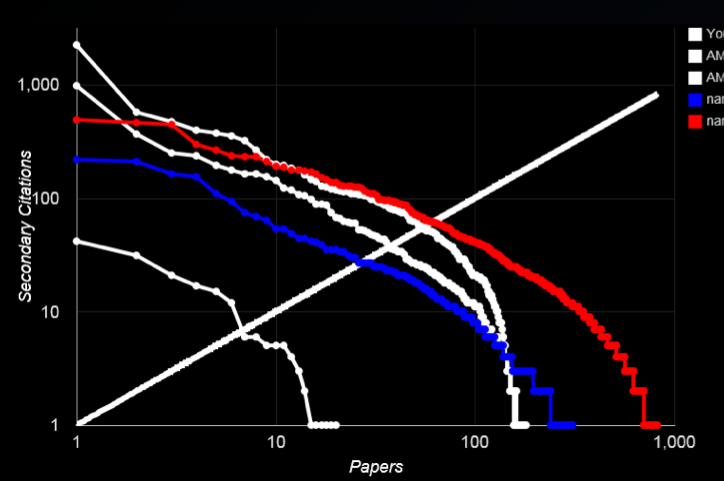
Strategy
Opportunity
Goal setting
Sustainability

Incentives?

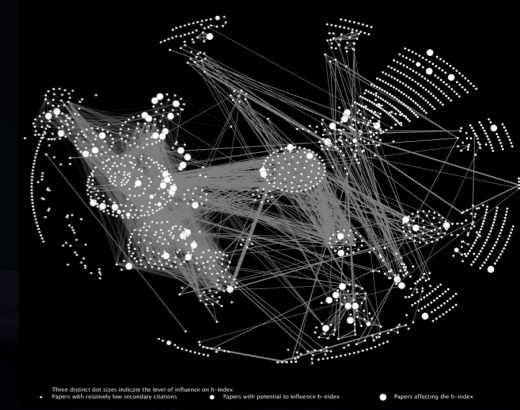
Innovations
Web Delivery
Visualization
Analytics, UQ



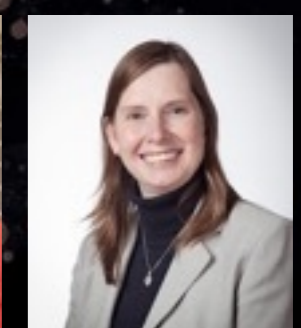
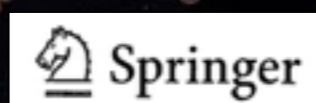
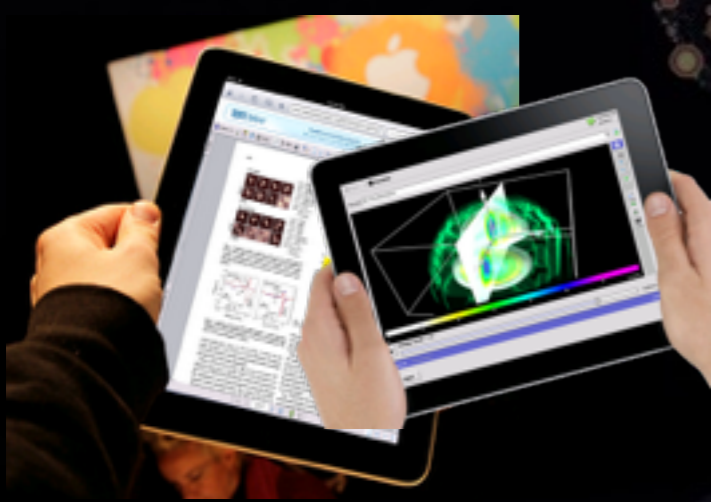
Reproducibility Culture Change



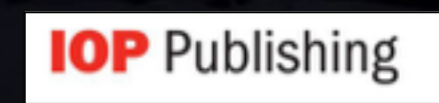
nanoHUB Citation Network (2000-2016)



to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways



Interactive nanoBIO special issue



Proposal
Vision
Culture Change
Sustainability

Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?

Strategy
Opportunity
Goal setting
Sustainability

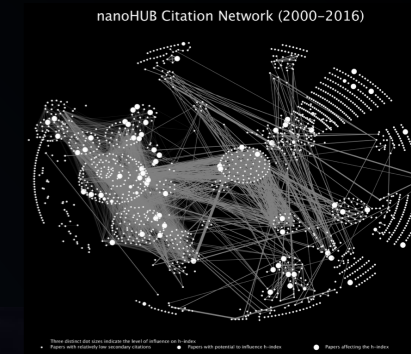
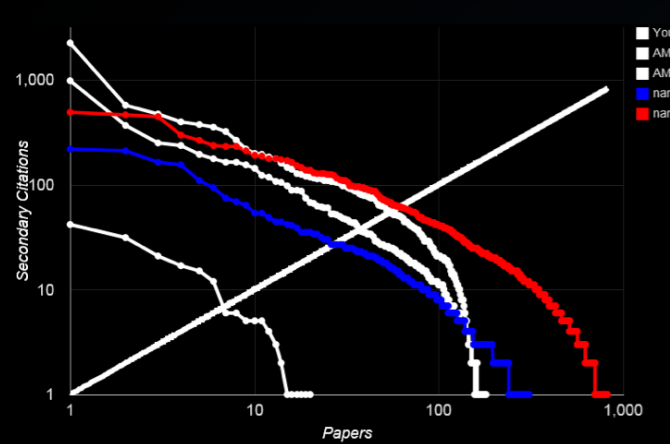
Incentives?

Innovations
Web Delivery
Visualization
Analytics, UQ



nanoHUB usage

New Publications!



**publishers
work together in new ways**



WEB OF SCIENCE™



THOMSON REUTERS™

Tools and Compact Models to be listed

Who are we? Impact?
 Research OR Education?
 Research? Good Research?
 Classroom usage?

Strategies?
 Opportunity driven?
 Goal setting, Diversity
 Sustainability

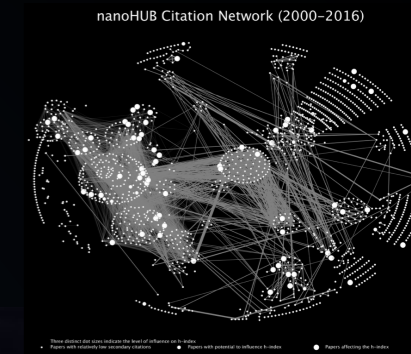
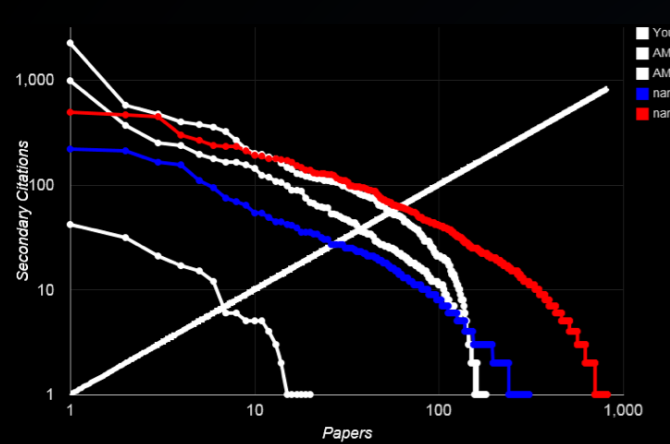
nanoHUB scalable?
 Cycles? Support?
 Developers?
 Incentives?

Proposal
 Vision
 Culture Change
 Sustainability



nanoHUB usage

New Publications!



to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and **publishers**

IOP Publishing

World Scientific
Connecting Great Minds

Springer

IEEE

WEB OF SCIENCE™



THOMSON REUTERS™

Tools and Compact Models to be listed

Strategies?

Opportunity driven?

Goal setting, Diversity

Sustainability

nanoHUB scalable?

Cycles? Support?

Developers?

Incentives?

Innovations

Web Delivery

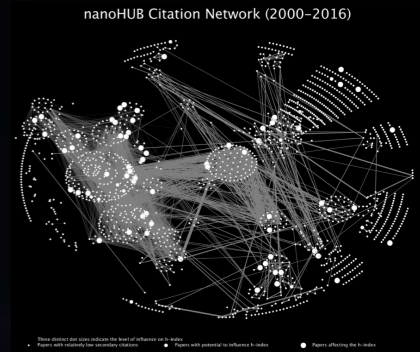
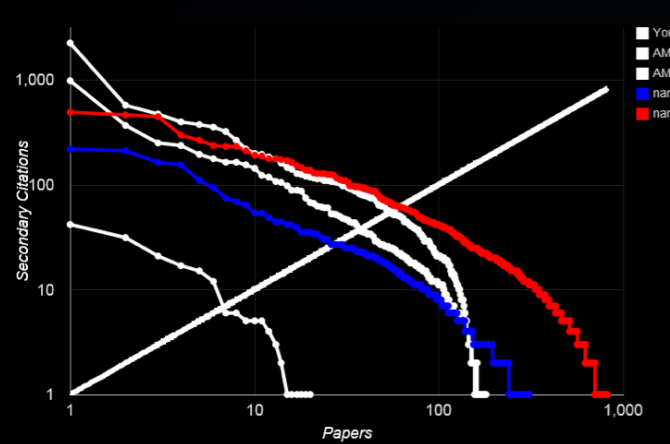
Visualization

Analytics, UQ

Who are we
Research OR
Research? Good
Classroom



New Standards!



to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways to continuously define new standards of learning and research



WEB OF SCIENCE™



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nanoHUB usage

Who are we? Impact?

Research OR Education?
Research? Good Research?
Classroom usage?

Strategies?

Opportunity driven?
Goal setting, Diversity
Sustainability

nanoHUB scalable?

Cycles? Support?
Developers?
Incentives?

Innovations

Web Delivery
Visualization
Analytics, UQ

Proposal

Vision
Culture Change
Sustainability



New Standards!

to create an energized, growing online community where researchers, developers, **educators**, industry practitioners, **students**, and publishers **work together in new ways to continuously define new standards of learning and research**

Who are we? Impact?

Research OR **Education?**

Research? Good Research?

Classroom usage?

Opportunity driven.
Goal setting, Diversity
Sustainability

HUB scalable?
Cycles? Support?
Developers?
Incentives?

Innovations
Web Delivery
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Analytics, UQ

Proposal
Vision
Culture Change
Sustainability



Automatic Class Detection

SEMESTER

educators,
students

STUDENTS

29,910 students,
1,501 courses,
185 institutions

nanoHUB is translational!
Research=>Education
200+ tools

Who are we? Impact?

Research OR **Education?**
Research? Good Research?
Classroom usage?

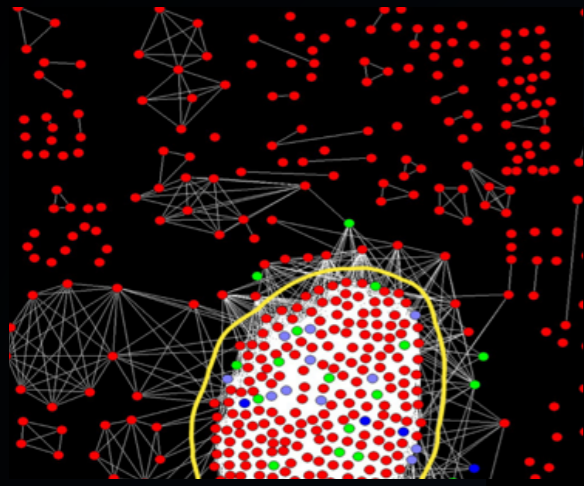
nanoHUB scalable?
Cycles? Support?
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Web Delivery
Visualization
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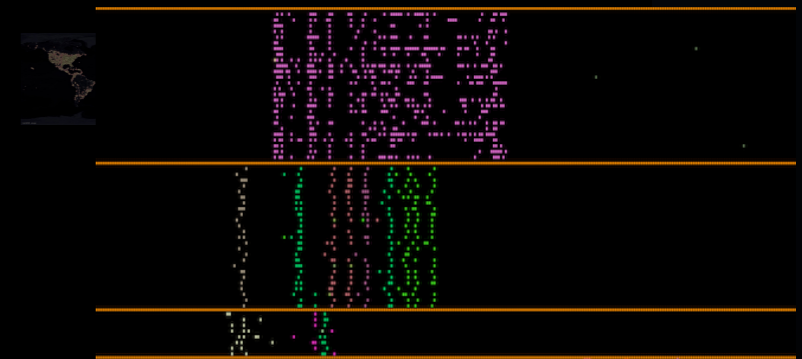
Proposal
Vision
Culture Change
Sustainability



Tool Classification



Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?



Strategies?
Opportunity driven?
Goal setting, Diversity
Sustainability

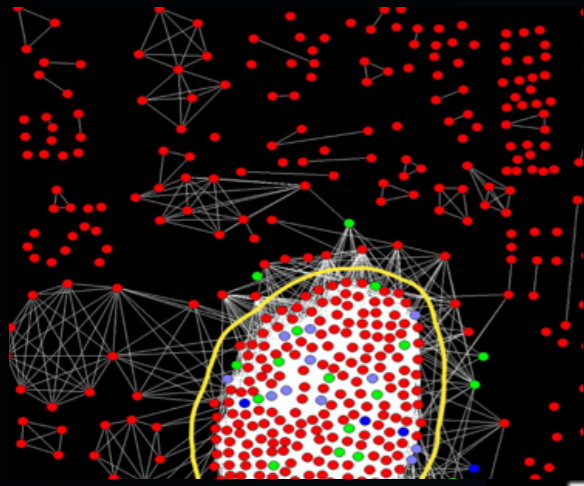
nanoHUB scalable?
Cycles? Support?
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Innovations
Web Delivery
Visualization
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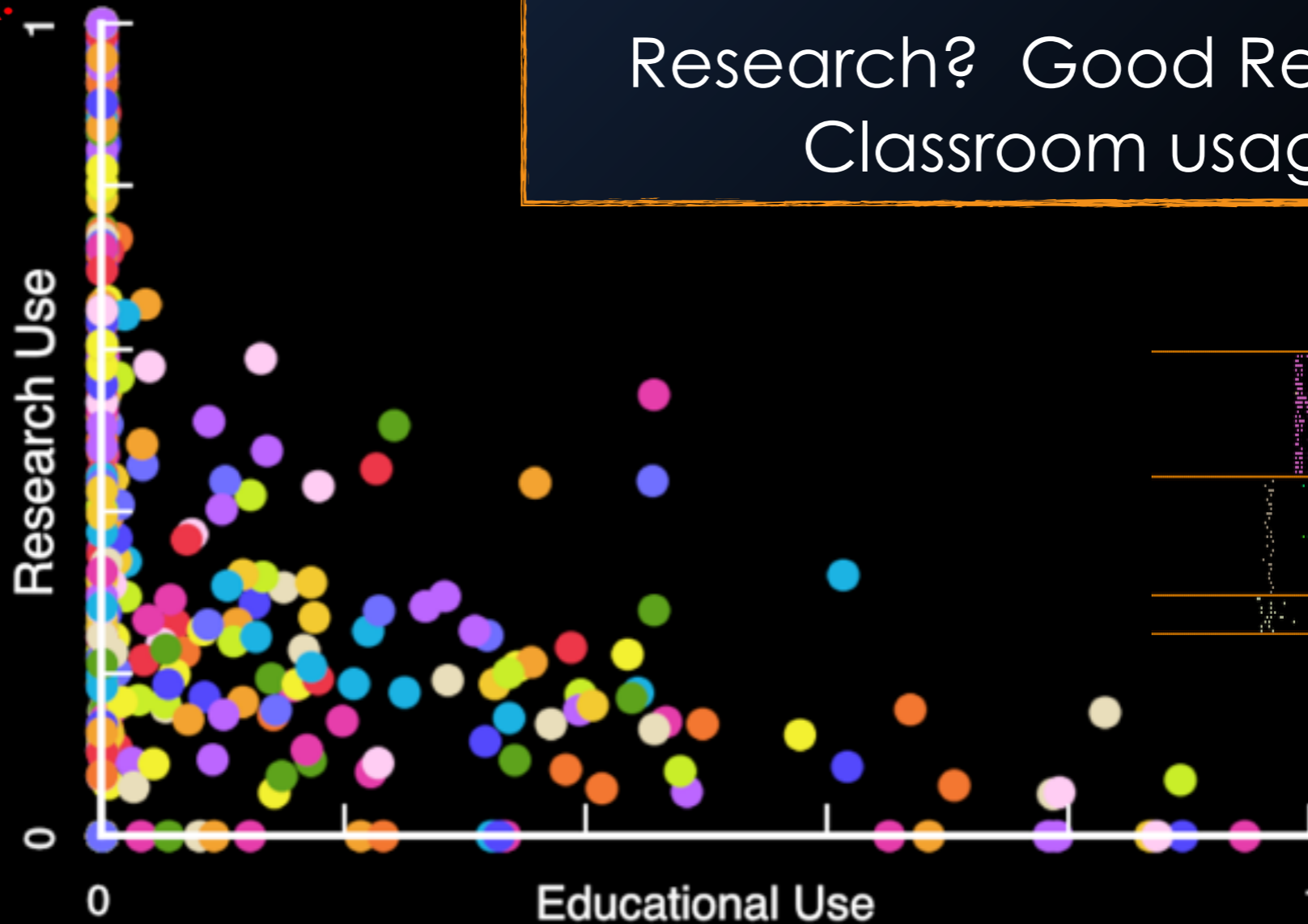
Proposal
Vision
Culture Change
Sustainability



Tool Classification



Who are we? Impact?
Research OR Education?
Research? Good Research?
Classroom usage?



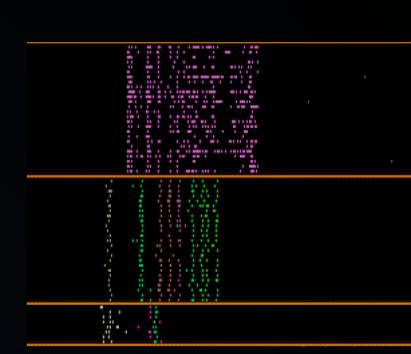
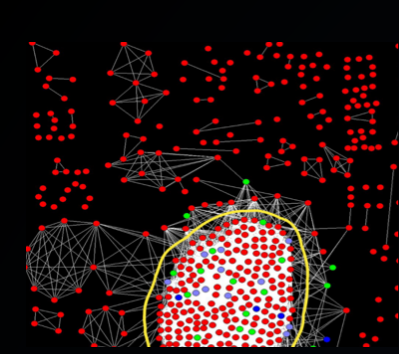
Strategies?
Opportunity driven?
Goal setting, Diversity
Sustainability

nanoHUB scalable?
Cycles? Support?
Developers?
Incentives?

Innovations
Web Delivery
Visualization
Analytics, UQ

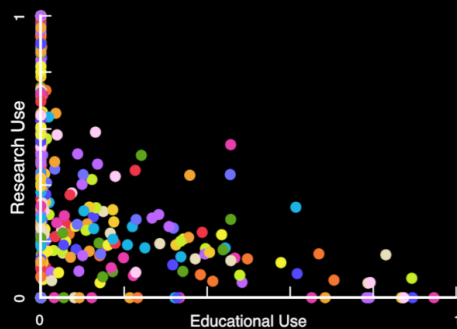
Proposal
Vision
Culture Change
Sustainability





nanoHUB lives culture change

where researchers, developers, educators,
industry practitioners, students, and publishers
new standards of learning and research



Who are we? Impact?

Research AND Education!

Research? Good Research?

Classroom usage?

Innovations

Web Delivery

Visualization

Analytics, UQ

Proposal

Vision

Culture Change

Sustainability

Vision

to create an energized, growing online community where researchers, developers, educators, industry practitioners, students, and publishers work together in new ways to continuously define new standards of learning and research and spawn new economic endeavors that accelerate the transition of nanoscience to nanotechnology.

nanoHUB usage

Who are we? Impact?

Research OR Education?
Research? Good Research?
Classroom usage?

Strategies?

Opportunity driven?
Goal setting, Diversity
Sustainability

nanoHUB scalable?

Cycles? Support?
Developers?
Incentives?

Innovations

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