



Network for Computational Nanotechnology (NCN)

Purdue, Norfolk State, Northwestern, MIT, Molecular Foundry, UC Berkeley, Univ. of Illinois, UTEP

The Production Process for Online Presentation Content on nanoHUB.org

Joseph M. Cychosz

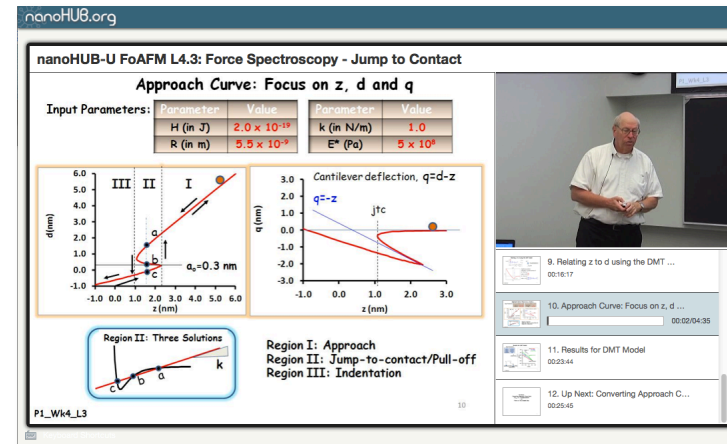
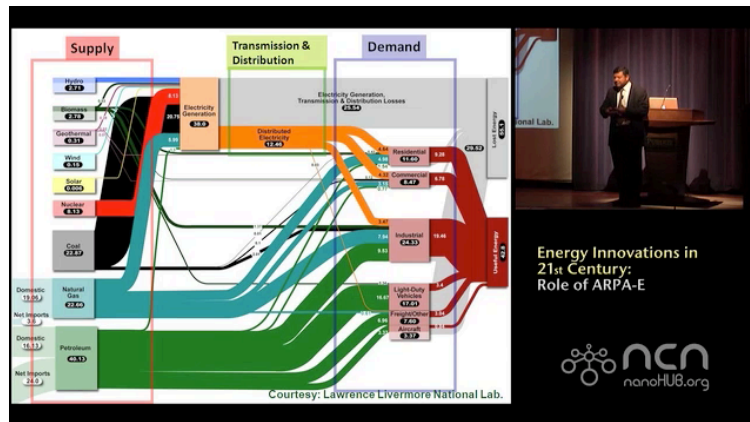
Online Presentation Production Manager

Network for Computational Nanotechnology (NCN)



Monday, September 24, 2012





Video

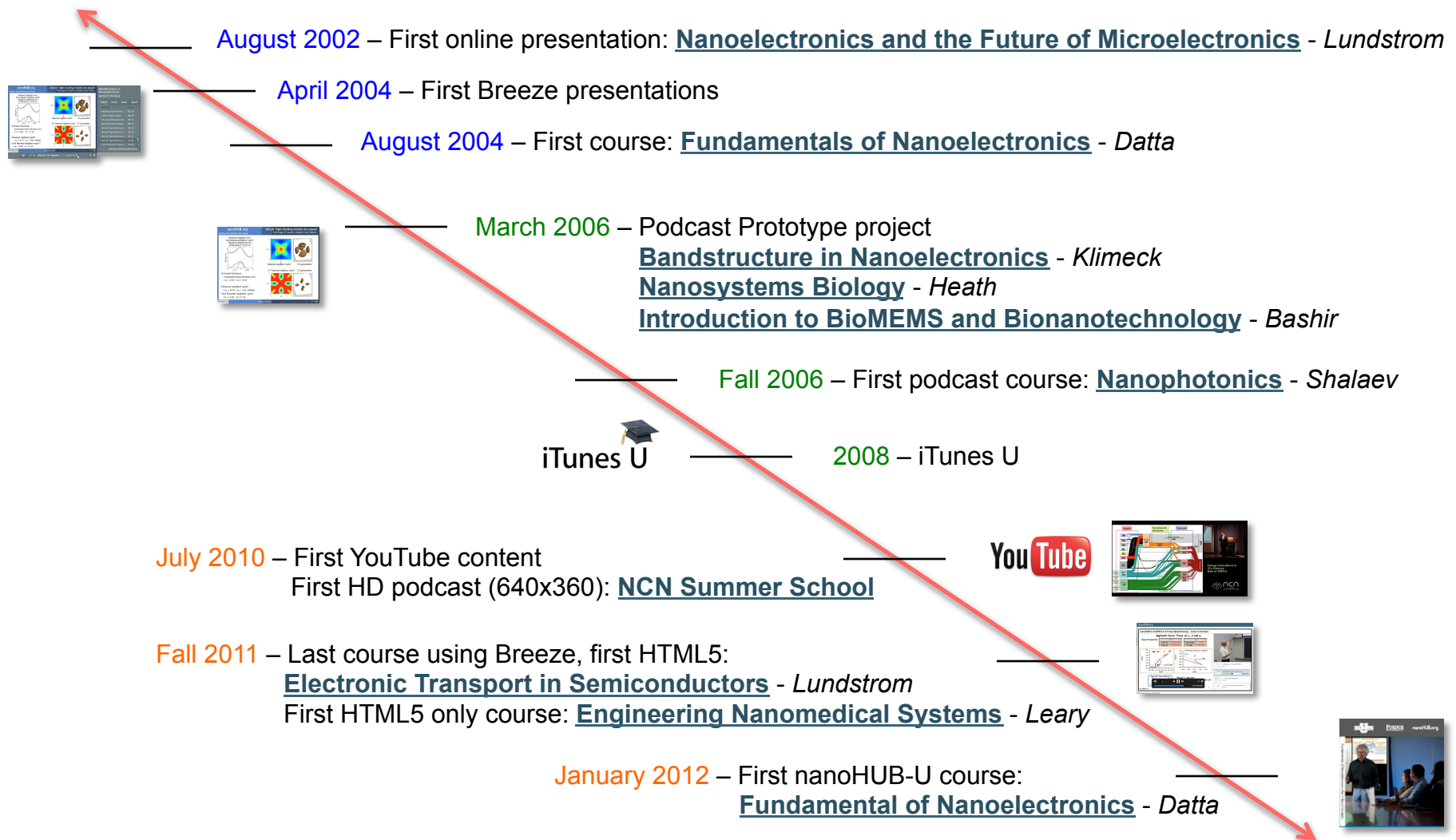
MP4 640x360

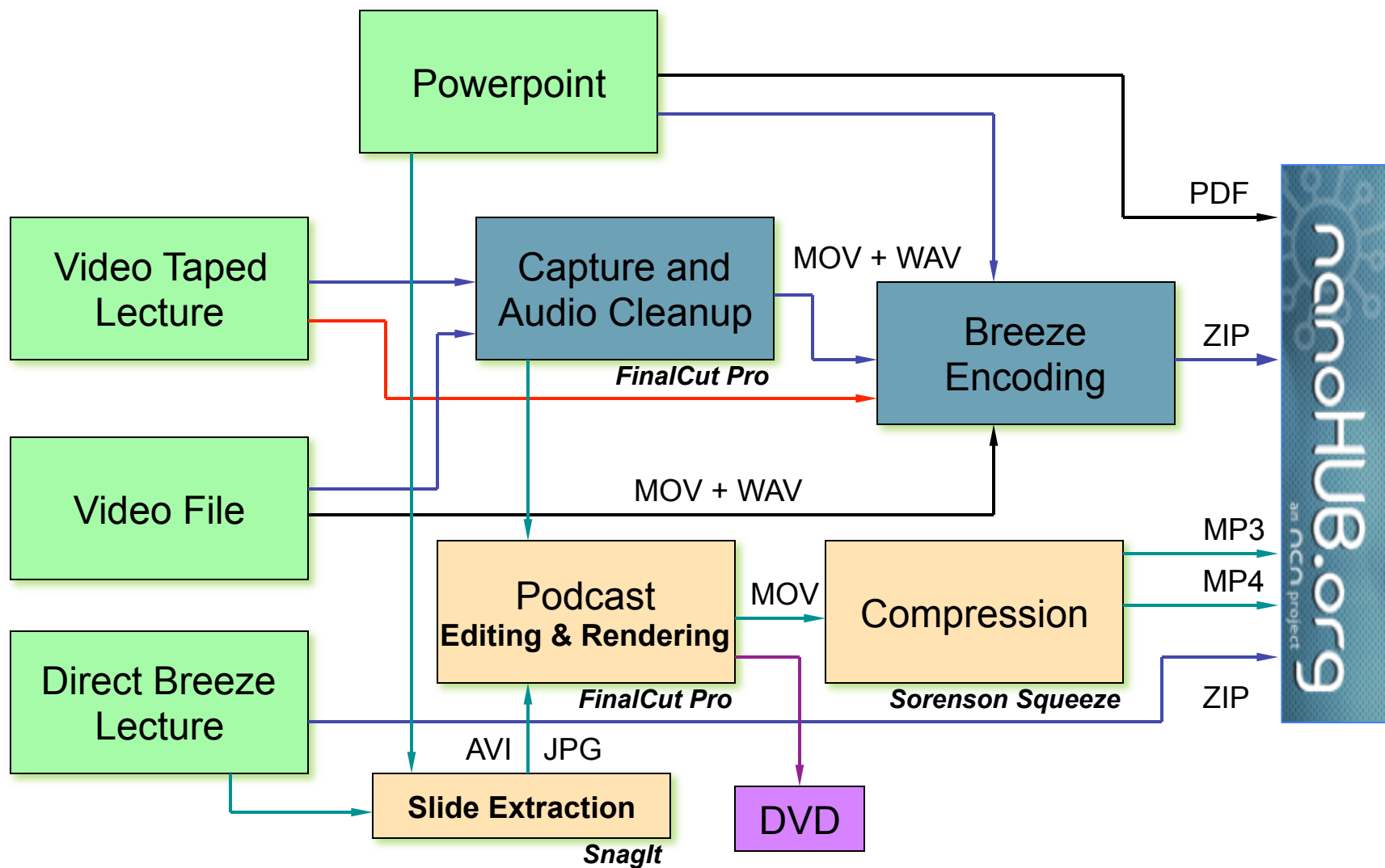
MP4 854x480



HTML5

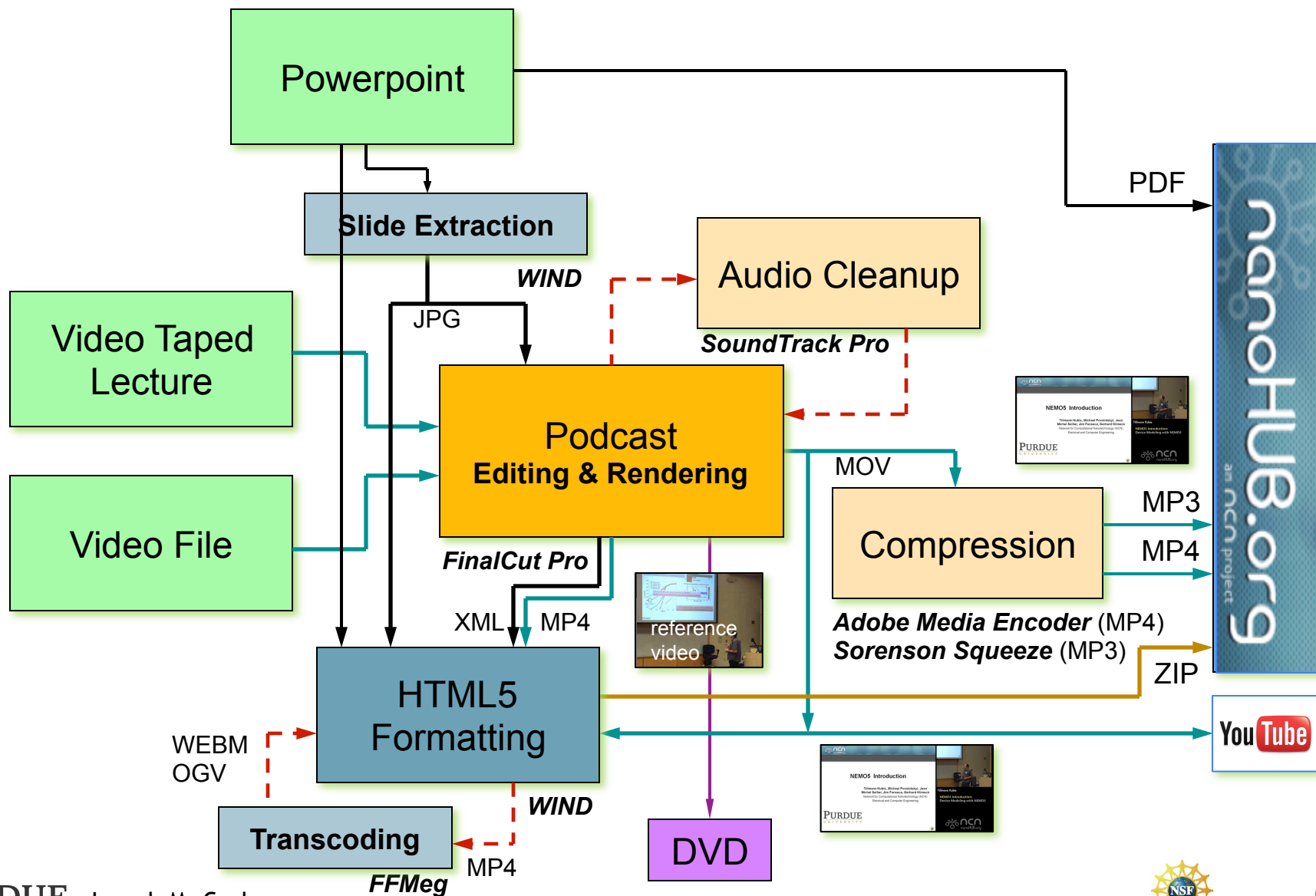
Player built in to hubZERO

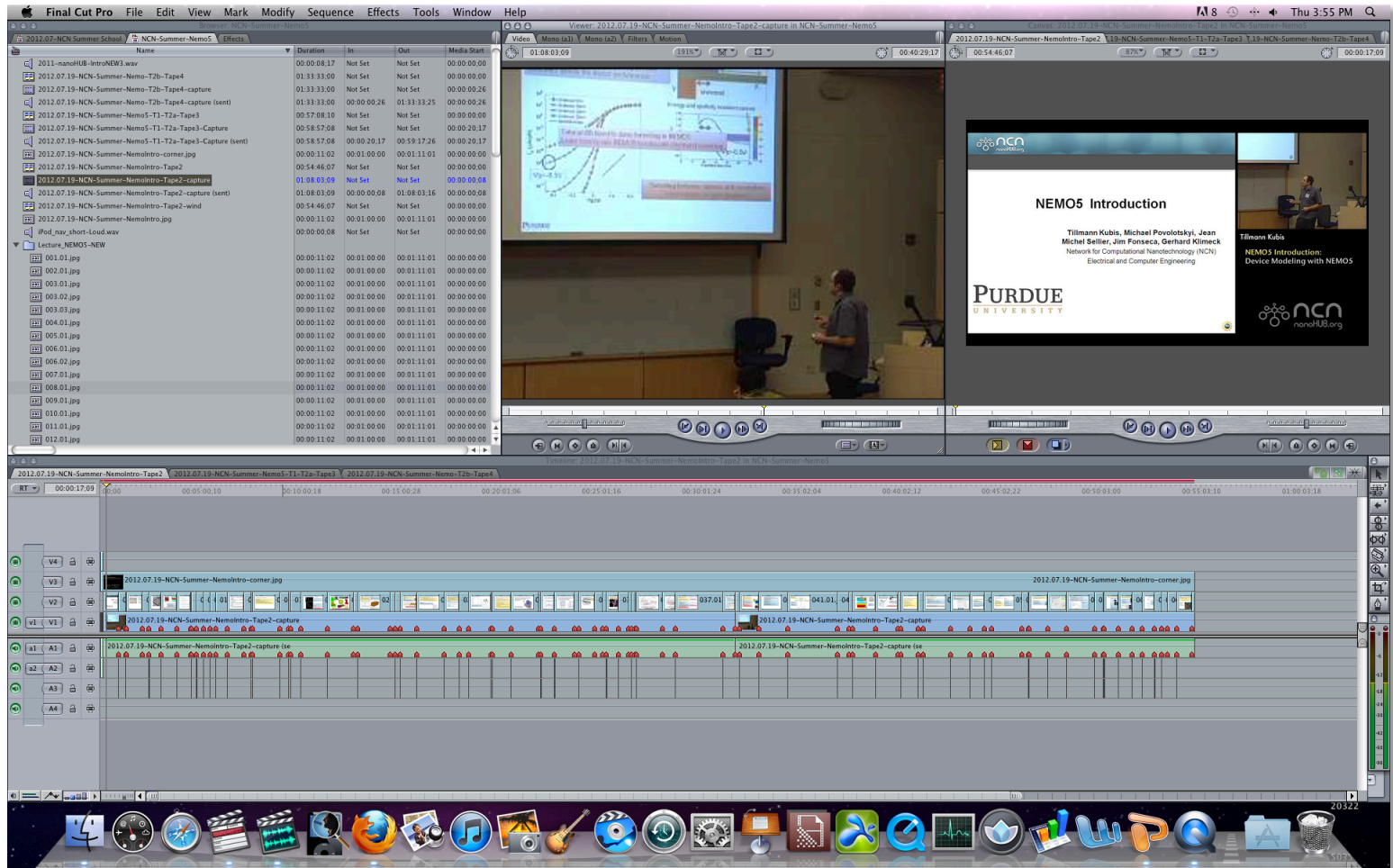






Ben Owens, Mike Skaggs, Joe Cychosz, Rick DeSutter





Apple FinalCut Pro

nanoHUB.org
online simulations and more

Not all Tight binding models are equal!
Pathology of nearest neighbor sp^{3s}* Model.

• Nearest neighbor and 2nd nearest neighbor sp^{3s}*
Identical dispersions in [100] and [111] for Si.

• Nearest neighbor sp^{3s}*:
+ conduction band minimum at X
+ m_c = 0.91 m_v = 0.19

• Nearest neighbor sp^{3s}*:
+ m_c = 0.74 m_v = 1.62 → infinite

• 2nd Nearest neighbor sp^{3s}*:
+ m_c = 0.89 m_v = 0.19

PURDUE
Gerhard Klimeck

320x240 with picture-in-picture

2006

(Bandstructure in Nanoelectronics– *Klimeck*)

Example: Transient, Uniform Illumination

$$\frac{\partial(\Delta n)}{\partial t} = -\frac{\Delta n}{\tau_n} + G$$

↓ ↓ ↓ ↓ ↓
1
Acceptor doped

$$\Delta n(x, t) = A + B e^{-4t/\tau_n}$$

t = 0, Δn(x, 0) = 0 ⇒ A = -B

t → ∞, Δn(x, ∞) = Gτ_n = A

$$\Delta n(x, t) = G\tau_n (1 - e^{-4t/\tau_n})$$

Alan ECE 600509

320x240 with picture-in-picture

2009

(ECE 606 Principles of Semiconductor Devices – *Alam*)

Side-by-side 640x360 HD
854x480 HD

Supply: Hydro (€2.9), Biomass (€2.2), Geothermal (€3.1), Wood (€1.5), Solar (€2.0), Nuclear (€3.1), Coal (€2.2), Domestic Natural Gas (€2.5), Net Imports (€3.2), Domestic Petroleum (€3.1), Net Imports (€1.0)

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Courtesy: Lawrence Livermore National Lab.

Energy Innovations in 21st Century: Role of ARPA-E

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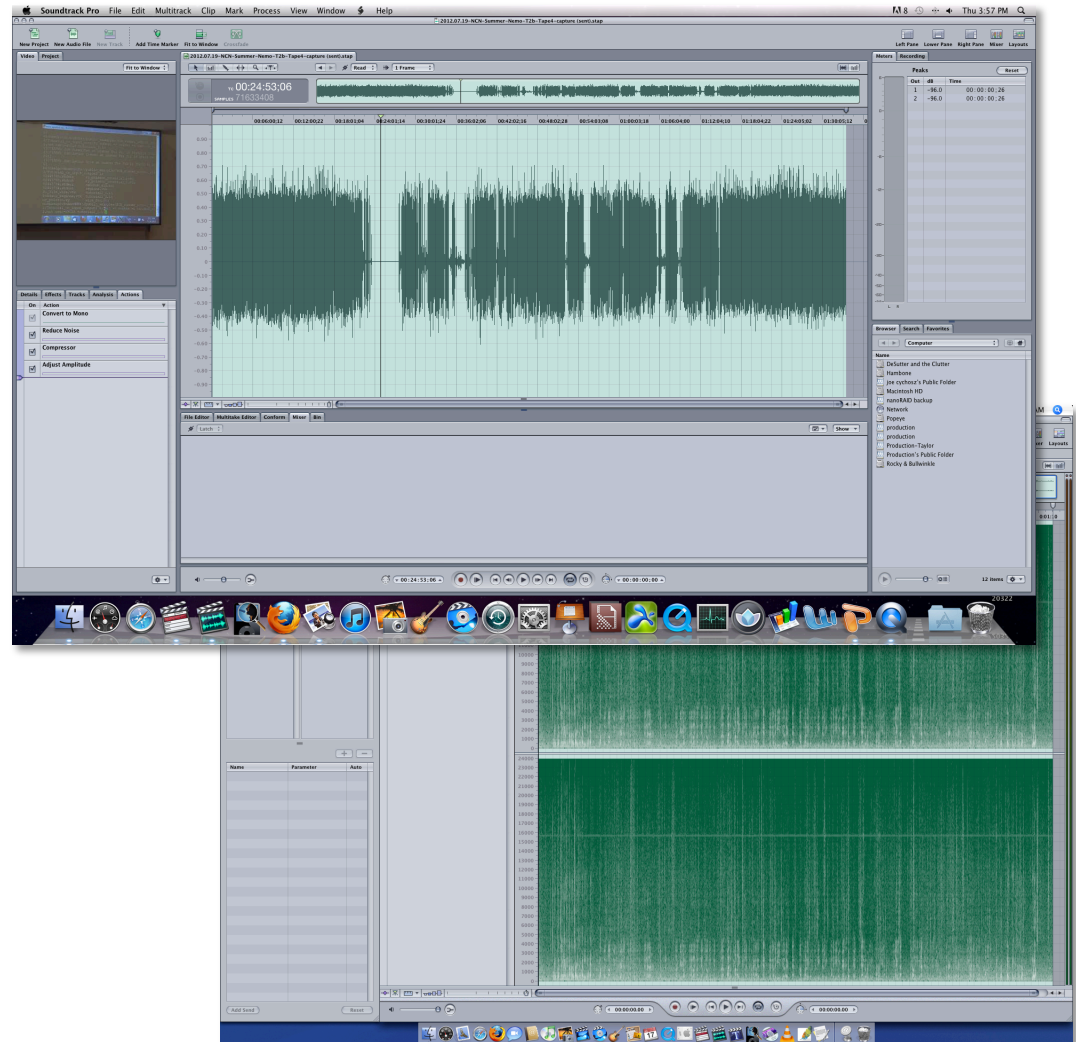
2010

(Energy Innovations in the 21st Century: Role of ARPA-E - *Majumdar*)

- **Filtering**
 - » High & low pass filtering
 - » Notch filtering
- **Signal Processing**
 - » Noise (click & pop) reduction
 - » Background sound removal
- **Current Process**
 - » Noise reduction
 - » Compression
 - » Level Boosting
 - » Edit coughs & questions



Audio demo ~1 min.



Apple SoundTrack Pro



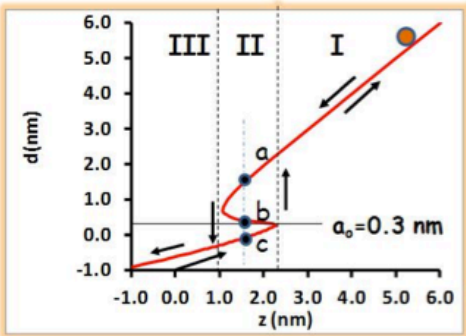
nanoHUB.org

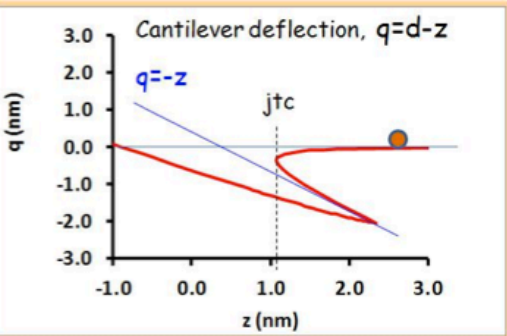
nanoHUB-U FoAFM L4.3: Force Spectroscopy - Jump to Contact

Approach Curve: Focus on z , d and q

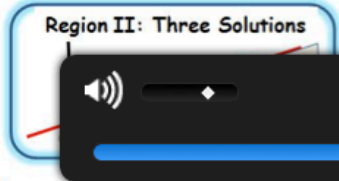
Input Parameters:

Parameter	Value	Parameter	Value
H (in J)	2.0×10^{-19}	k (in N/m)	1.0
R (in m)	5.5×10^{-9}	E^* (Pa)	5×10^8

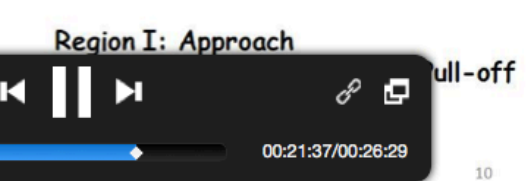


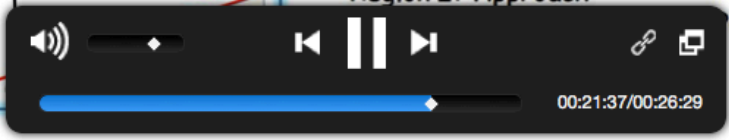


Region II: Three Solutions



Region I: Approach





P1_Wk4_L3

10

9. Relating z to d using the DMT ... 00:16:17

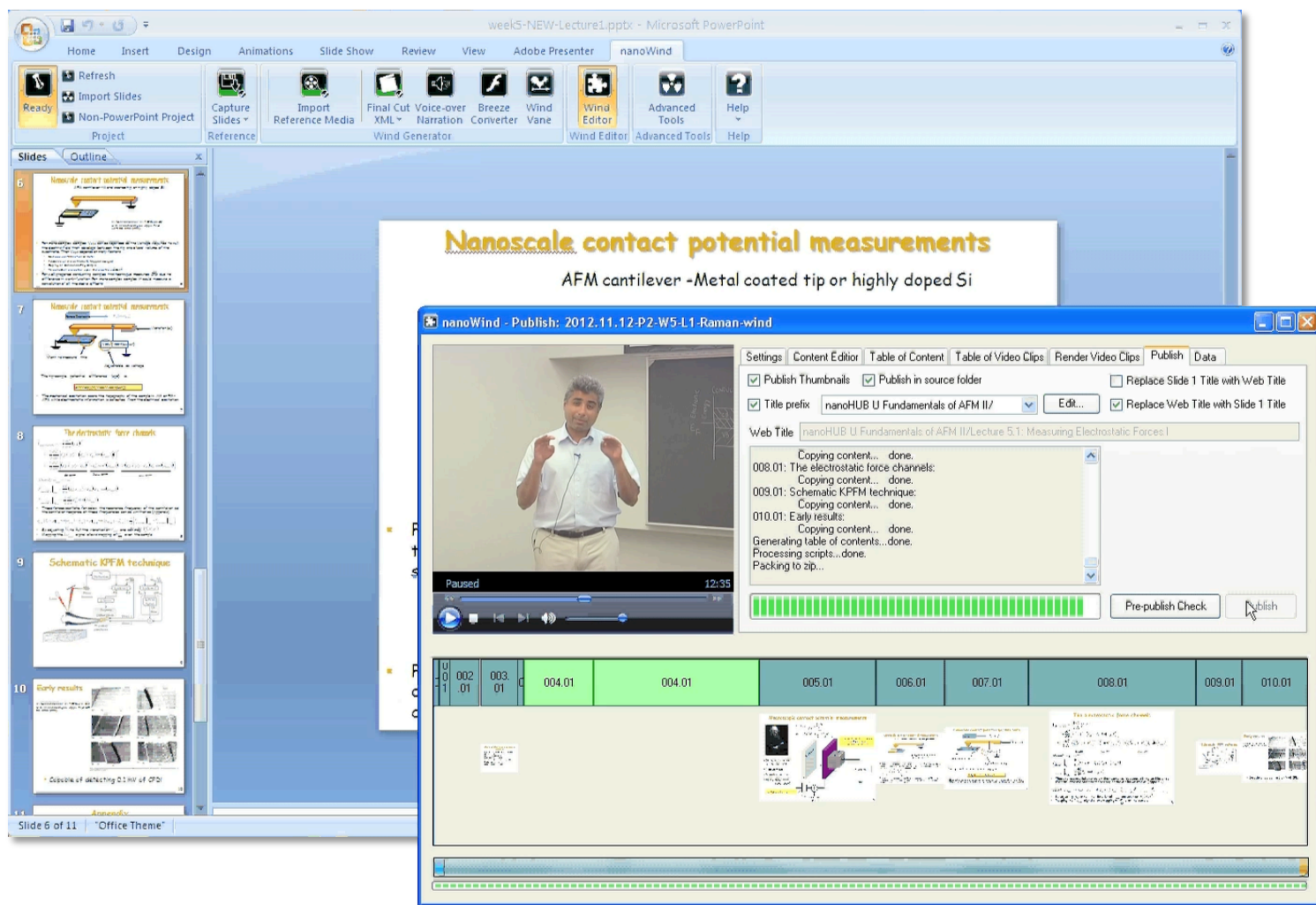
10. Approach Curve: Focus on z , d ... 02:28/04:35

11. Results for DMT Model 00:23:44

12. Up Next: Converting Approach C... 00:25:45

nanohub.org/resources/14350/watch#

HUBpresenter implemented for HUBzero by Chris Smoak



Nanoscale contact potential measurements
AFM cantilever - Metal coated tip or highly doped Si

nanoWIND - Publish: 2012.11.12-P2-W5-L1-Raman-wind

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Publish Thumbnails Publish in source folder Replace Slide 1 Title with Web Title

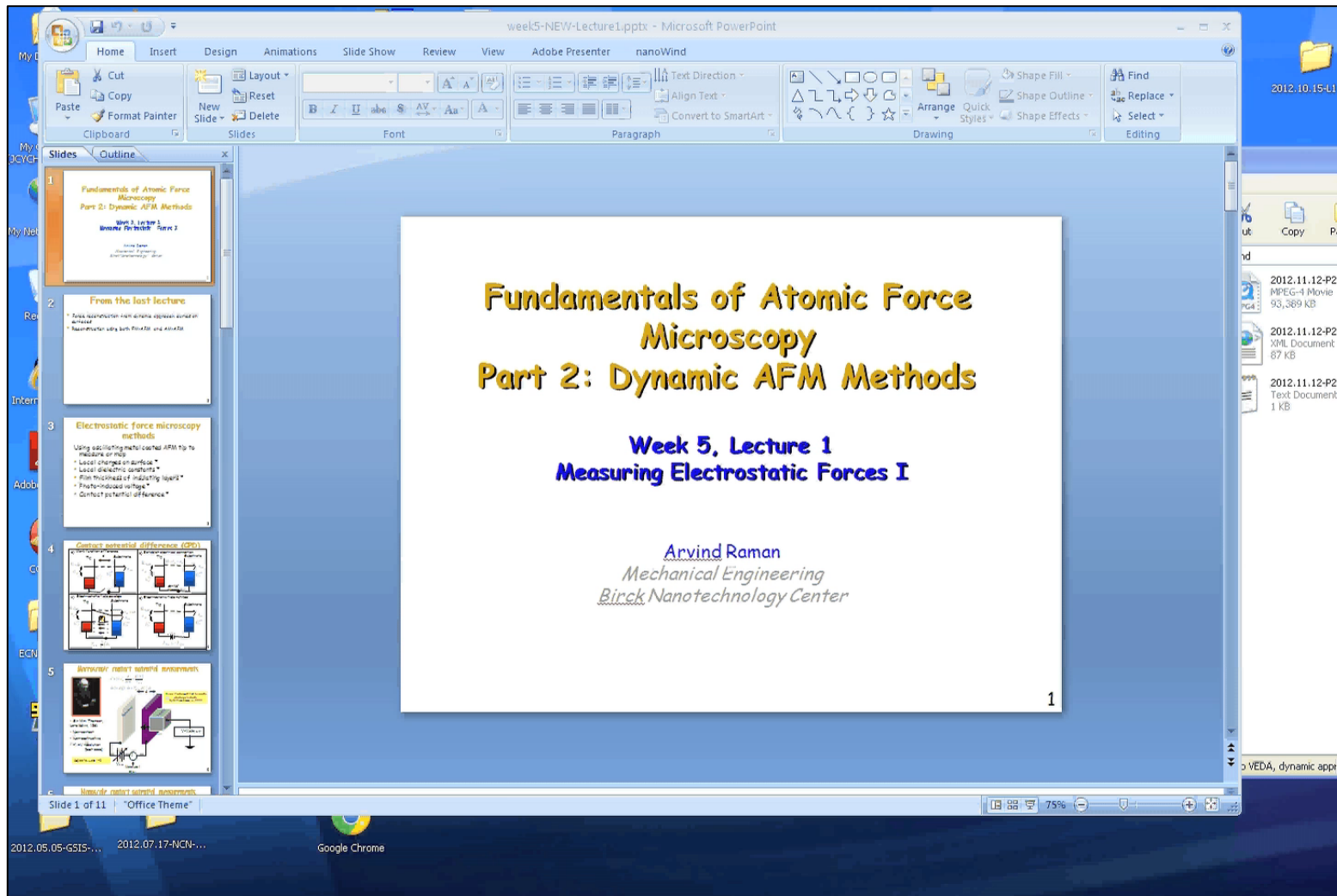
Title prefix nanoHUB U Fundamentals of AFM II/ Replace Web Title with Slide 1 Title

Web Title nanoHUB U Fundamentals of AFM II/Lecture 5.1: Measuring Electrostatic Forces I

Copying content... done.
008.01: The electrostatic force channels: Copying content... done.
009.01: Schematic KPFM technique: Copying content... done.
010.01: Early results: Copying content... done.
Generating table of contents...done.
Processing scripts...done.
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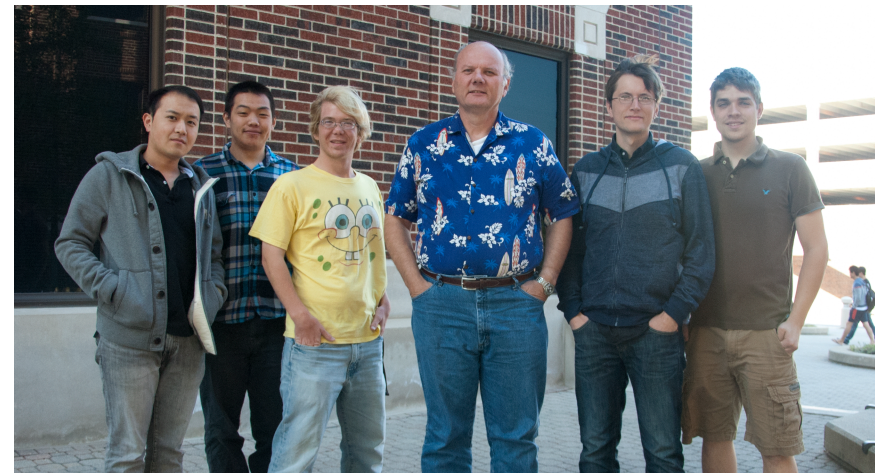
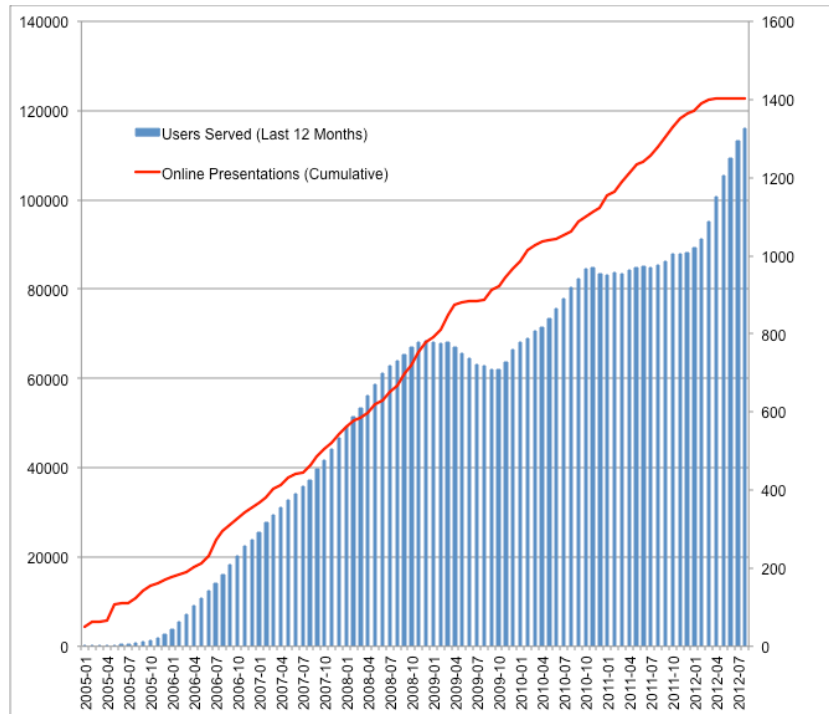
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• Apple Keynote now supported!!!

Video demo ~2:30.



Tianwei "David" Liu, Zhipeng Laing, Carl Sommer, Joe Cychosz, Rick Desutter, Mike Hlava, (not shown) Mario Hernandez

And the HUBzero Team

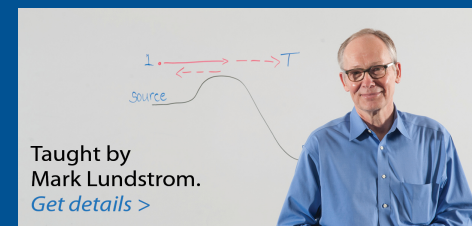
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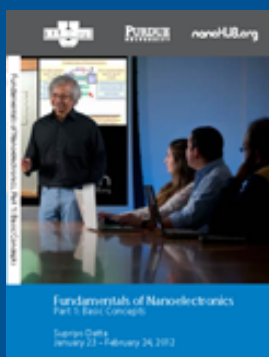
Coming This Fall – Registration Now Open



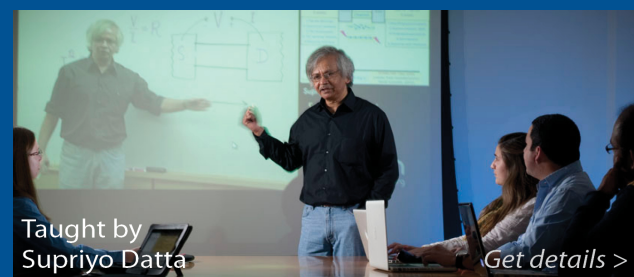
Taught by Ron Reifengerger and Arvind Raman. [Get details >](#)

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Part 2 “Dynamic AFM” Starts Soon – Registration Now Open



FUNDAMENTALS NANO ELECTRONICS



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(Also available on DVD with free online access)