

# Welcome to NACK's Webinar

## **Remote Access to Nano-Characterization Tools**

NetWorks is an NSF-funded ATE Resource Center supporting faculty in Semiconductor, Automated Manufacturing, and Electronics education

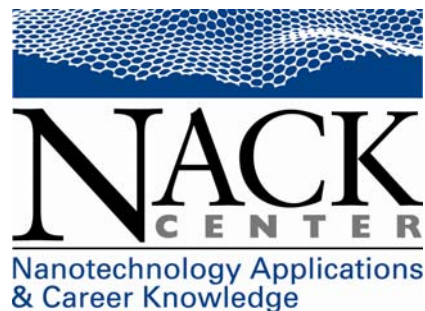
## **Classroom Ready Resources in the Digital Library**

## **TechSpectives Blog**

## **Webinars**

All this and more at [www.matecnetworks.org](http://www.matecnetworks.org)





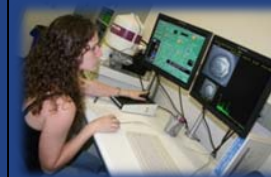
NACK is the NSF ATE National Center for  
Nanotechnology Applications and Career  
Knowledge

The NACK National Center is located at  
Penn State University



National  
Science  
Foundation

Funded, in part, by a grant from the  
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DUE-08020498



# NetWorks Webinar Team

Mark Viquesney



Webinar Host

Lara Smith



Marketing & Management  
Support

Darlene Cieplinski



Administrative Support

Shay Johnson



Technical Support





## Poll

Participants

Mark Viquesney (Moderator, Me)

1 Participant

Raise hand/smile/clap

Icons for raising hand, smiling, and clapping are circled in red.

## Chat

Show All

Joined on February 25, 2009 at 1:08 PM

Send to This Room

## Audio

Microphone Speaker

Ctrl+F2

## Whiteboard - Main Room

15/29 Welcome to MATEC NetWorks Webinar

☒ Follow Moderator ☐ Roam

# Welcome to MATEC NetWorks Webinar


# Whiteboard

Classroom Ready Resources in the Digital Library

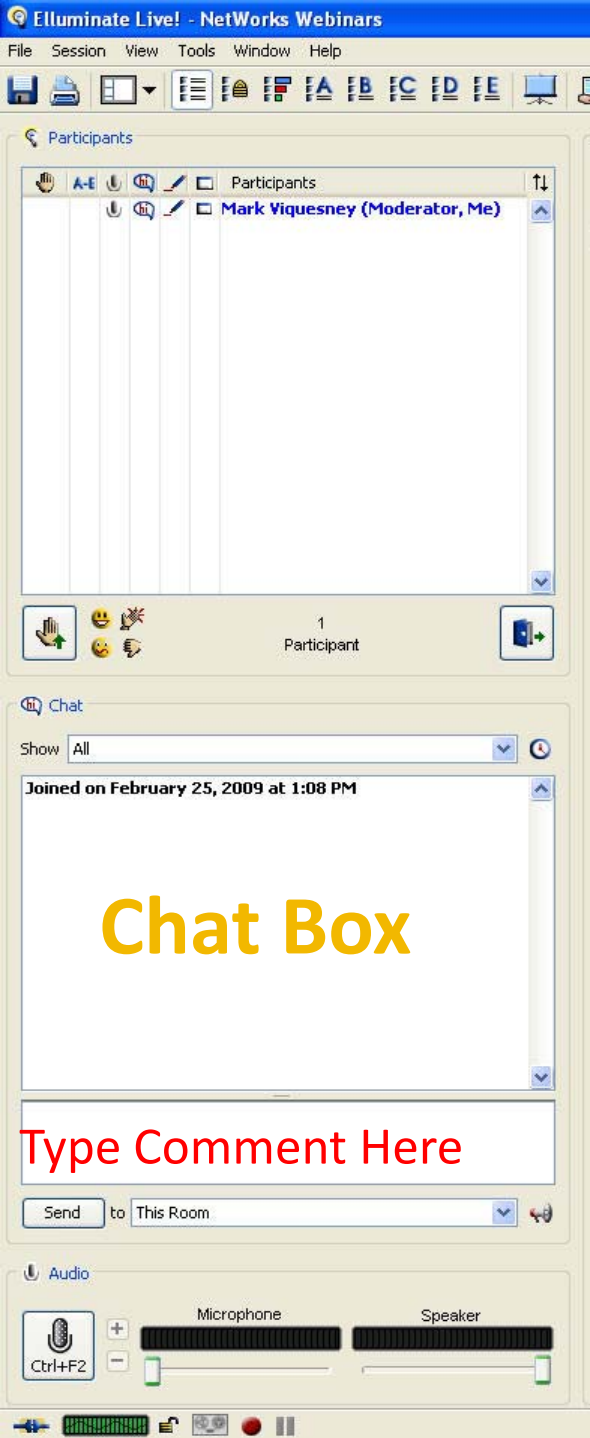
TechSpectives Blog

Webinars

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 NETWORKS

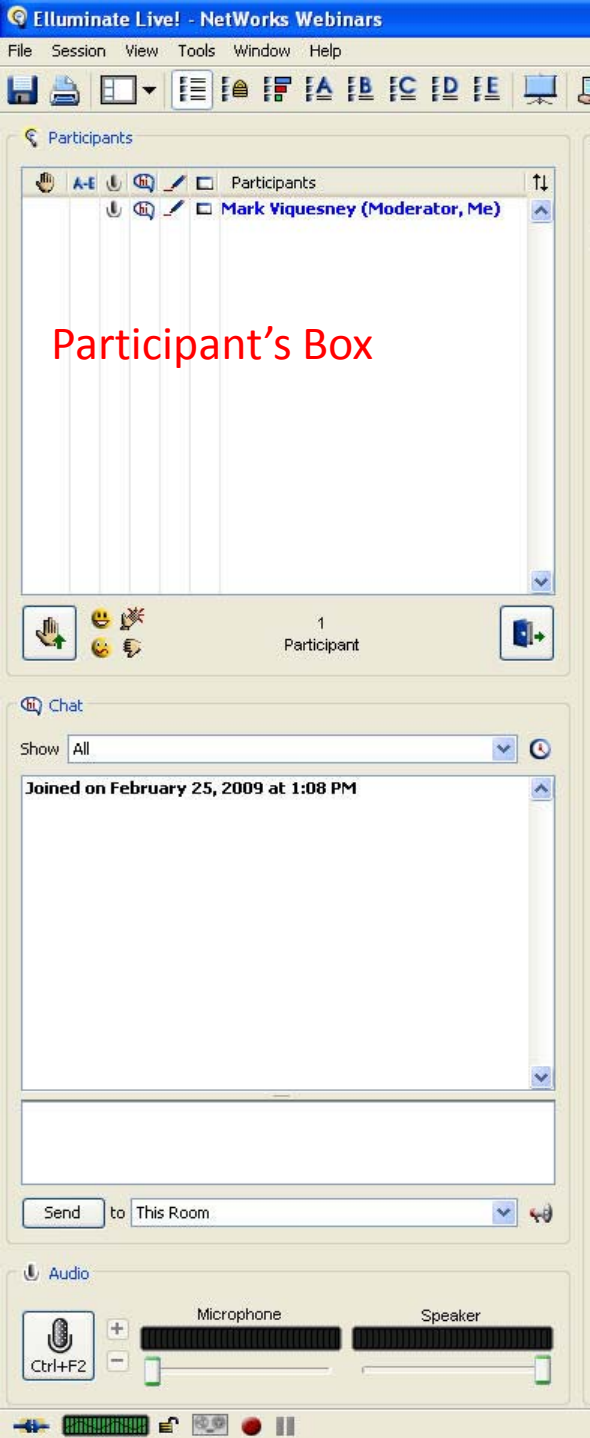




# Chat Box

In the **Chat Box**, please type the name of your school or organization, your location, and how many people are attending with you today.



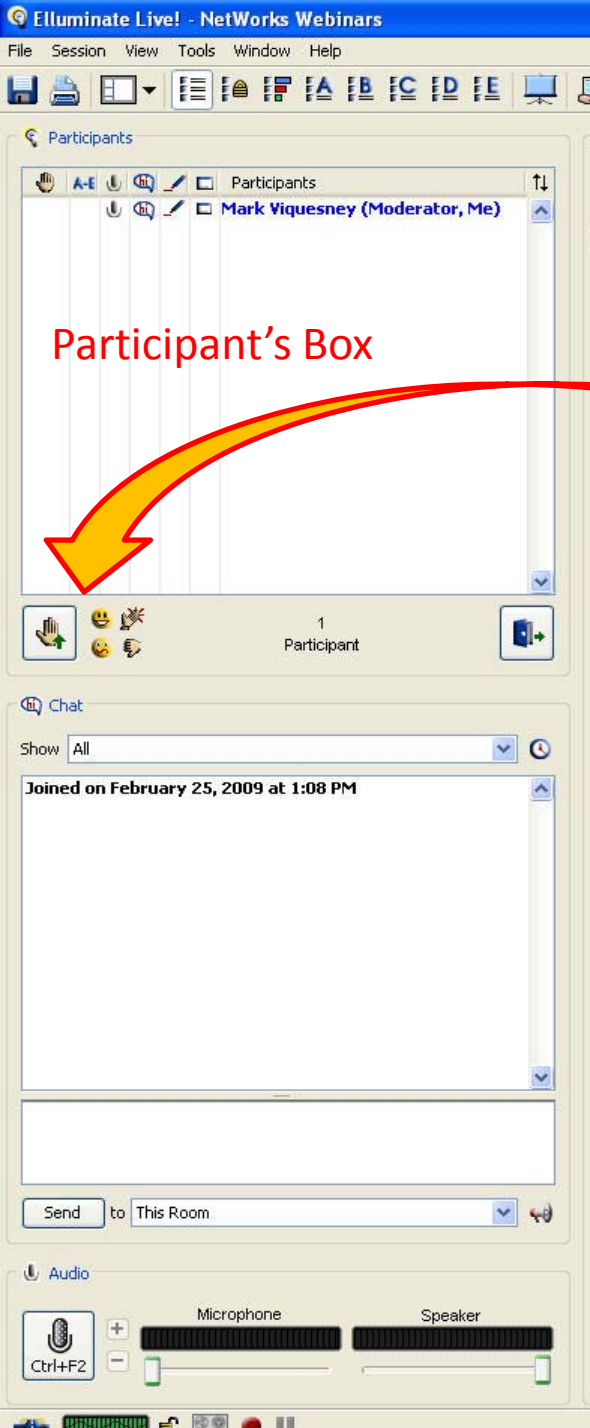


# Participant's Box

Allows you to non-verbally respond to the presenter's comments.

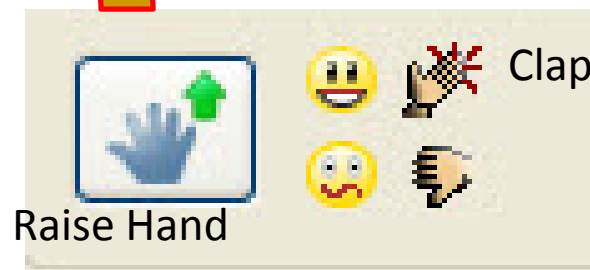






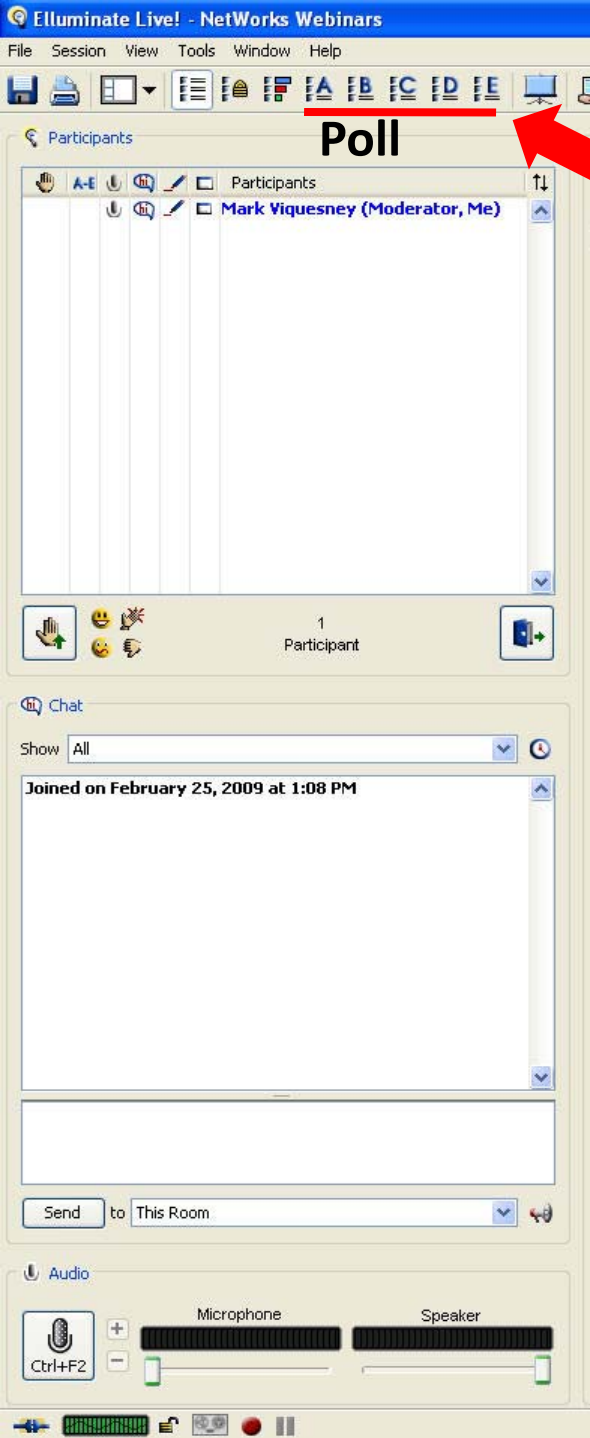
# Participant's Box

Smile



Let the presenter know if you like what they say with a smile or clap. Raise a hand if you have a question – and then type it into the chat box.





# Poll

Click A-E to take the Poll

This webinar will have a Poll. Please answer:  
I heard about this webinar through:

- A. @matec
- B. Email from ETD list serv
- C. Email from NACK
- D. Friend or colleague
- E. Other (please type where in chat box)





# NetWorks Webinar Presenter



Amy Brunner

[abrunner@engr.psu.edu](mailto:abrunner@engr.psu.edu)

814-865-8977

Research Associate  
Center for Nanotechnology  
Education and Utilization (CNEU)  
Nanotechnology Applications and  
Career Knowledge (NACK) Center  
The Pennsylvania State University



# Question

Describe your institution:

A. High School

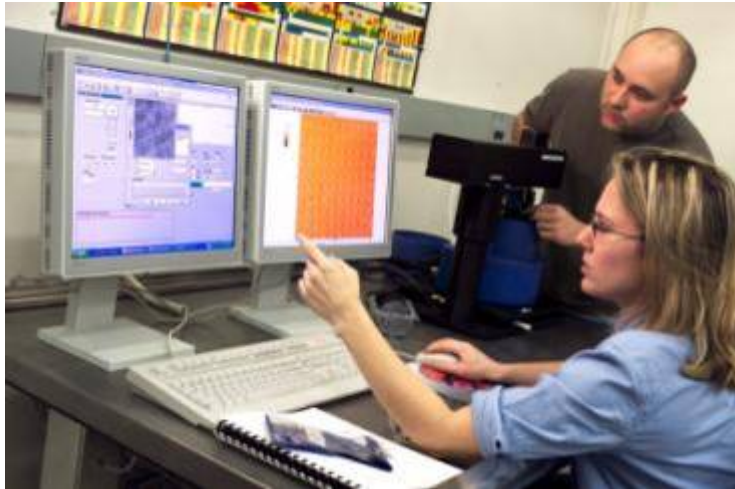
B. Vocational Technical High School

C. 2 year College

D. 4 year College



# Remote Access



**From our lab...**

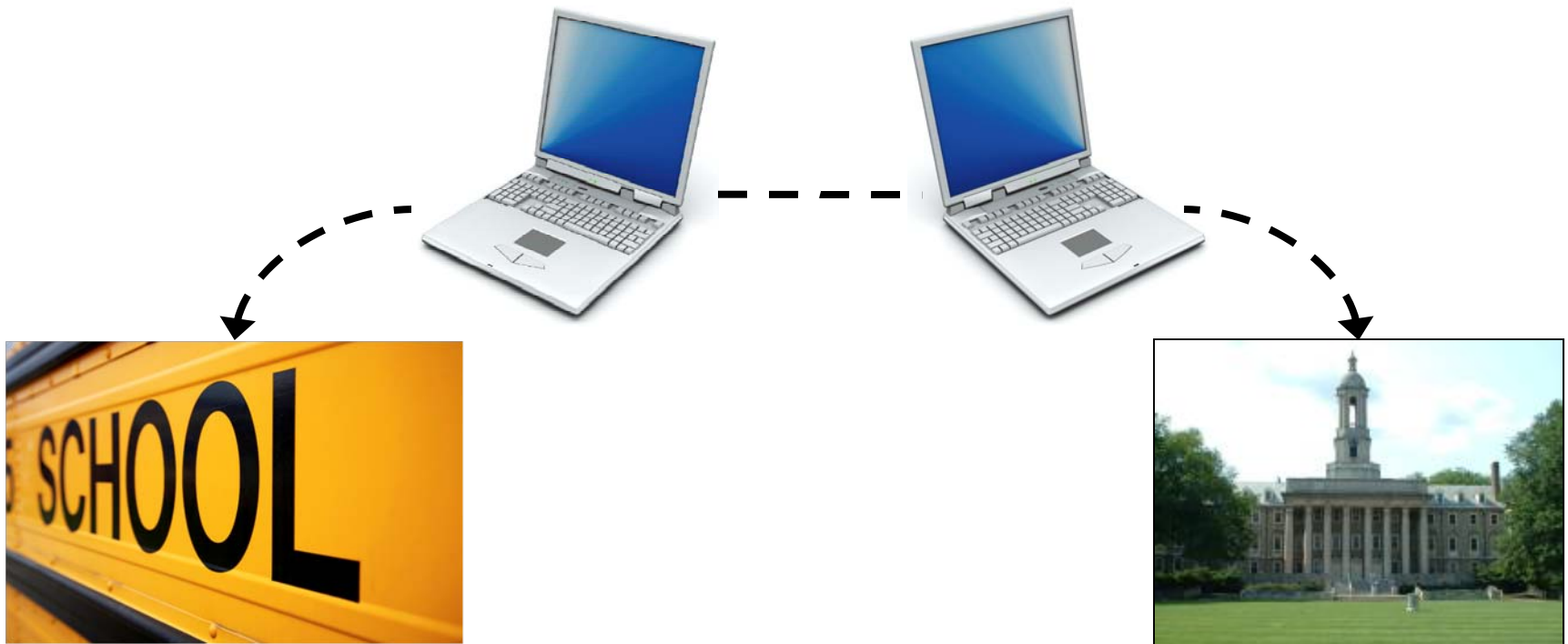
**...to your classroom!**



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Remote Access is a way to utilize high-tech equipment at a research institution through an Internet connection at any school.



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# Remote Access can be Utilized...

- For an Outreach Experience
- For Workshop Demonstrations
- For Class Demonstrations
- To Supplement the Equipment at an Institution
- For “Hands-On” Access by students in their laboratory experiences





# Question

Have you used Remote Access in your classroom?

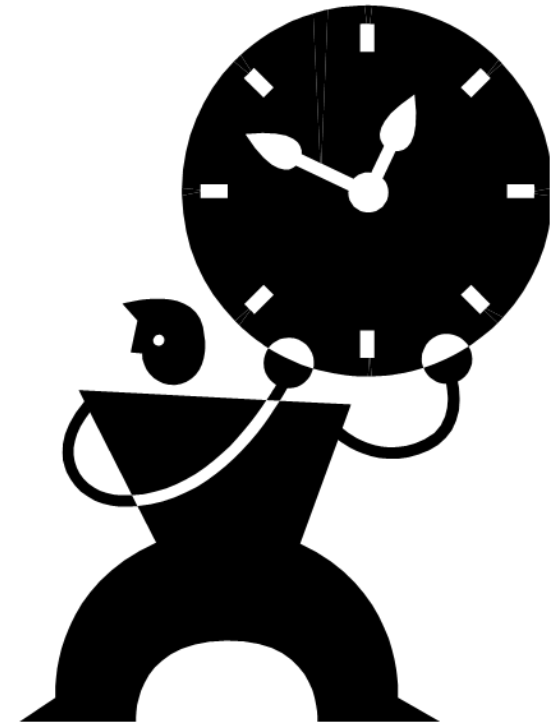
A. Yes

B. No





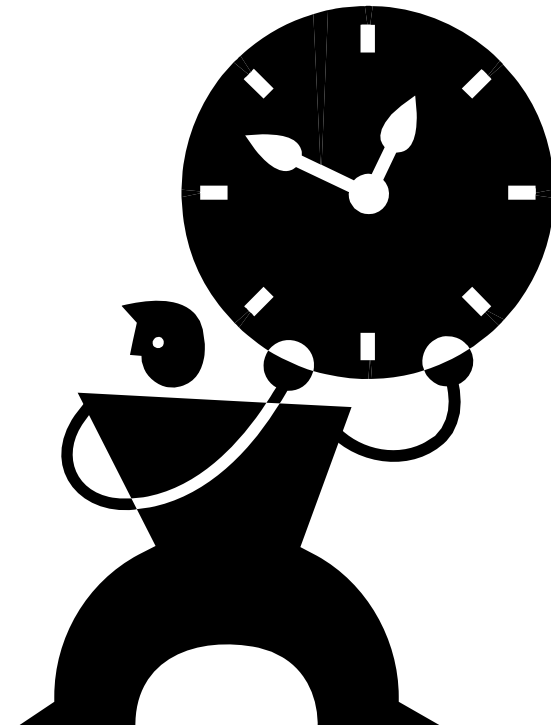
# Advantages of Remote Access



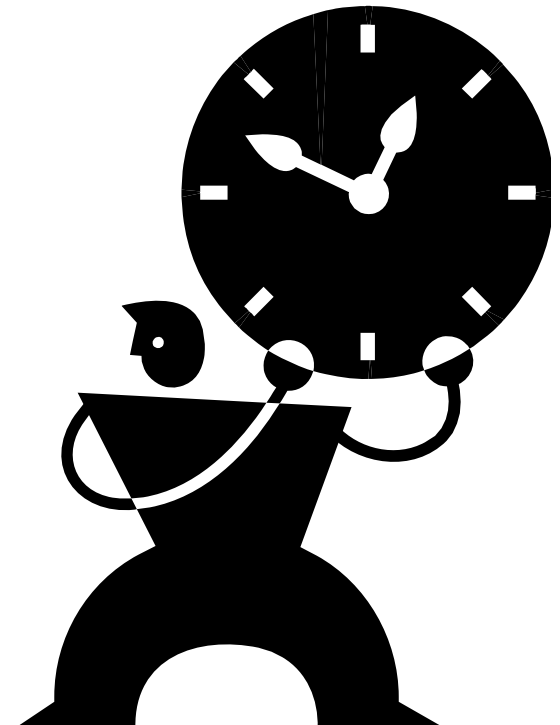
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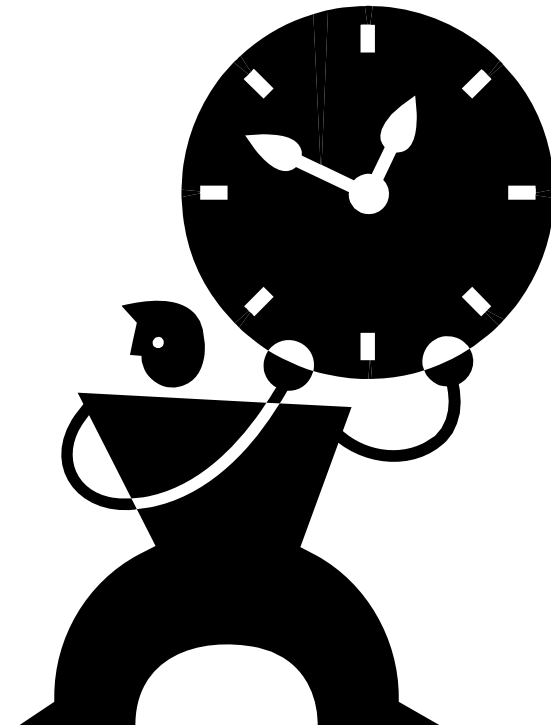
# Advantages of Remote Access



# Advantages of Remote Access



# Advantages of Remote Access








# Questions or Comments

Type them in your chat window




# Remote Access



Nanotechnology Applications and Career  
Knowledge NACK) National Center

Colloidal Gold Nanoparticle  
Synthesis and Characterization


Remote Access  
Laboratory Guide



**In this exercise, you will:**

- Understand the synthesis of the colloidal nanoparticle solutions.
- Gain experience in nanoscale characterization.
- Learn how nanostructures interact with light and how it is dependent on size.

*Take Matter Into Your Own Hands*



- NACK has integrated remote components into a number of nanotechnology classroom experiments.
- This will allow students to visualize what they create first hand, remotely.





# Existing Labs

- Gold Nanoparticle Synthesis and Characterization
- Nickel Nanowire Synthesis and Characterization
- Dye-Sensitized Nanocrystalline Solar Cell Fabrication and Characterization

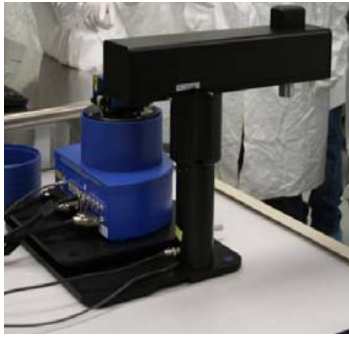


# Where is this Information Located?

- [www.nano4me.org](http://www.nano4me.org)
  - Educators Tab
  - NACK Resources
  - Log in/sign in
  - Remote Access
  - Example Activities



# What Resources are Available?



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# Information Gained Remotely

## Tools

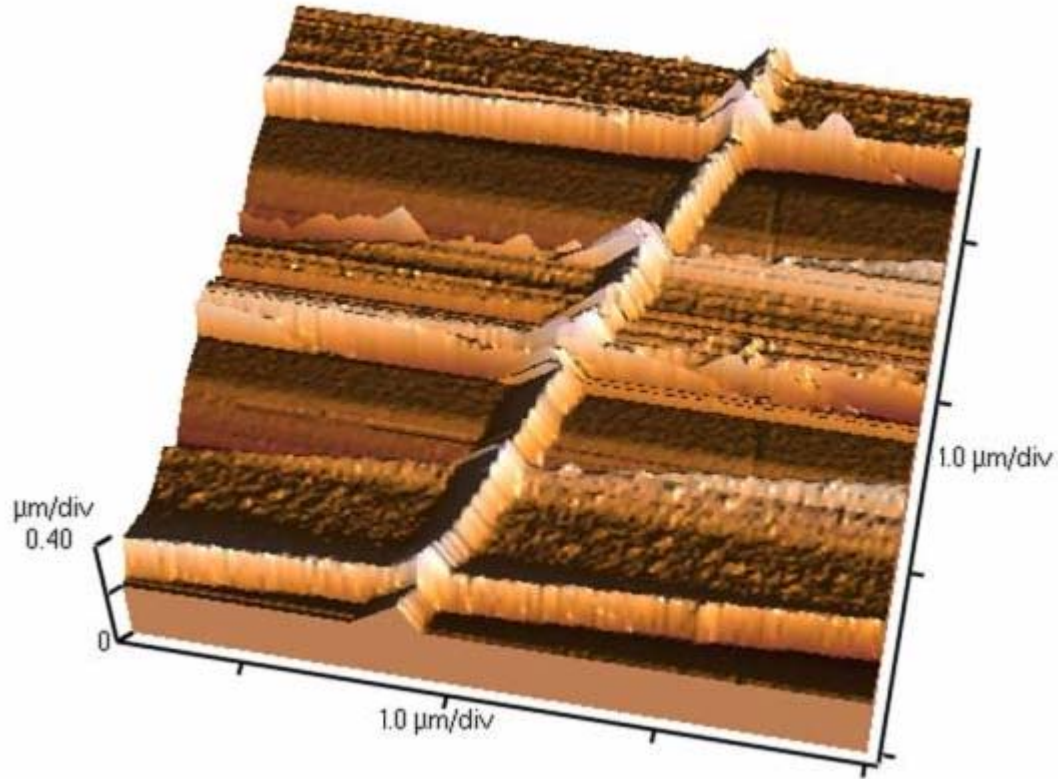
- AFM
- Profilometer
- Optical Microscopes
- SEM
- UV-Vis spectrophotometer
- Ellipsometer
- IV station

## Data

- Topography
- Magnetic fields
- Step height
- Scale
- Fluorescence
- Chemical Composition
- Light Absorption
- Thin film thickness
- Resistance
- Capacitance

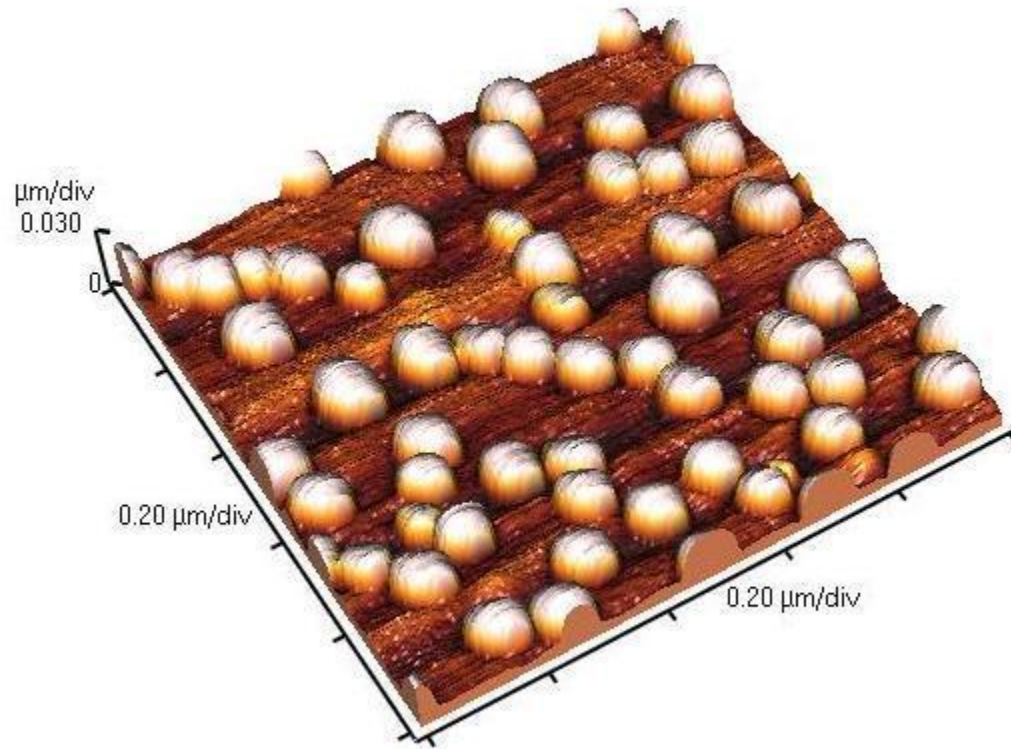


# Nanowires



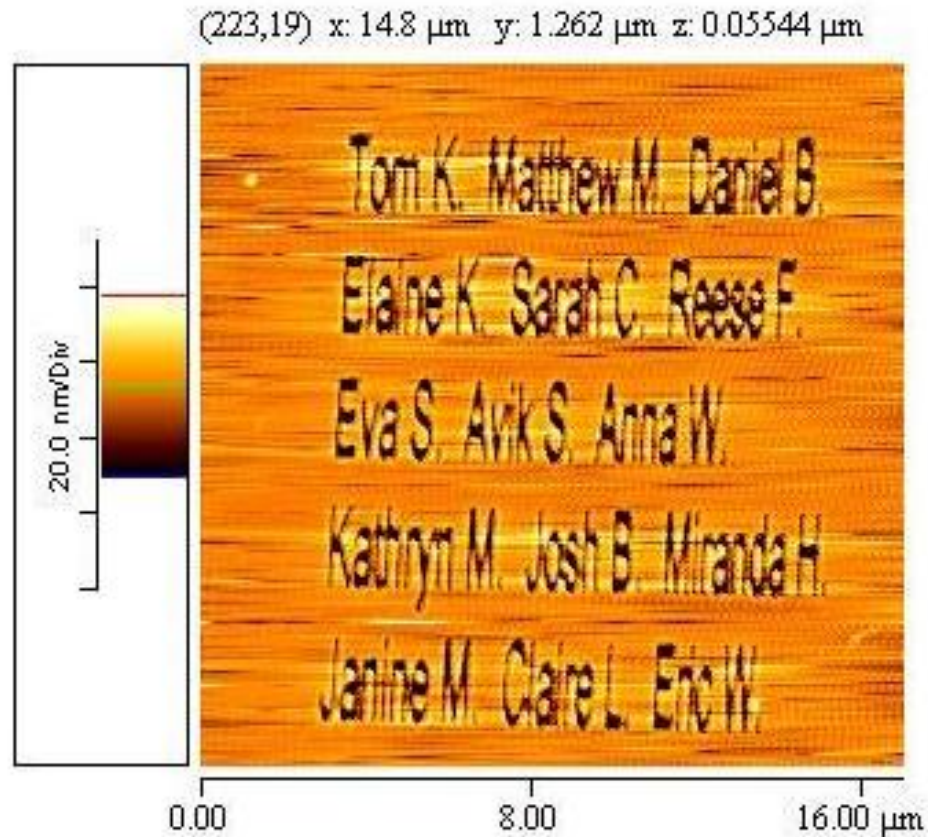


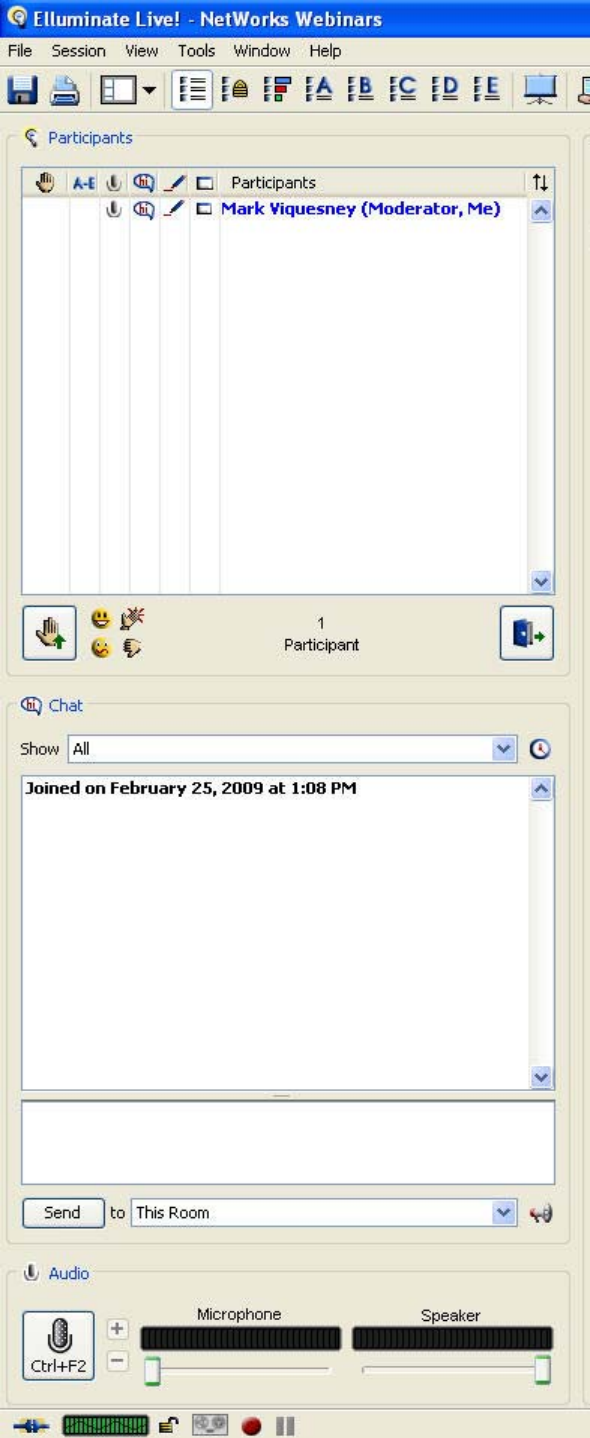
# Nanoparticles





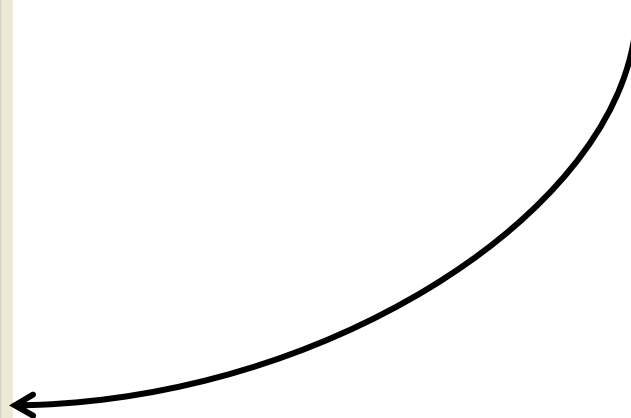
# Focused Ion Beam samples



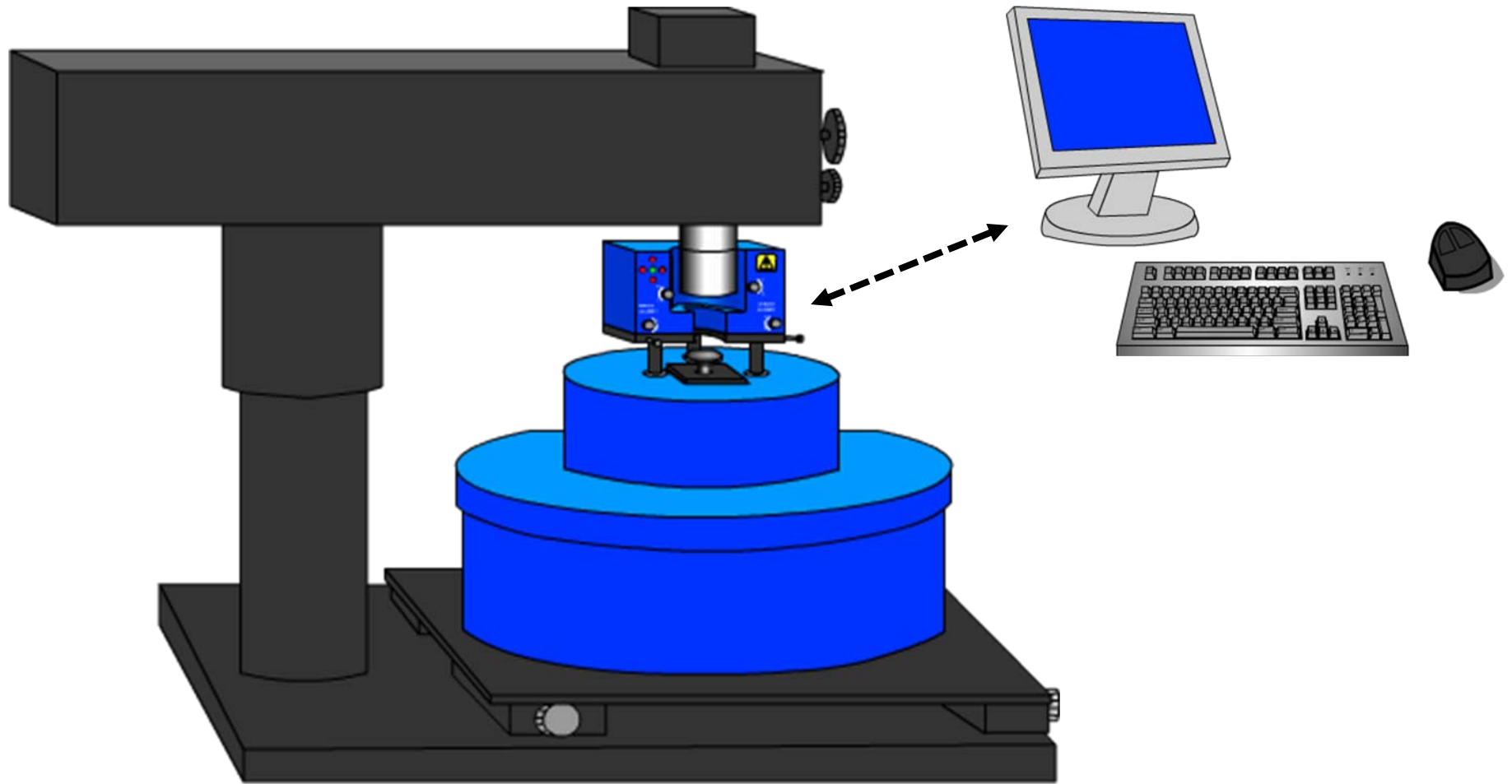


# Questions or Comments

Type them in your chat window

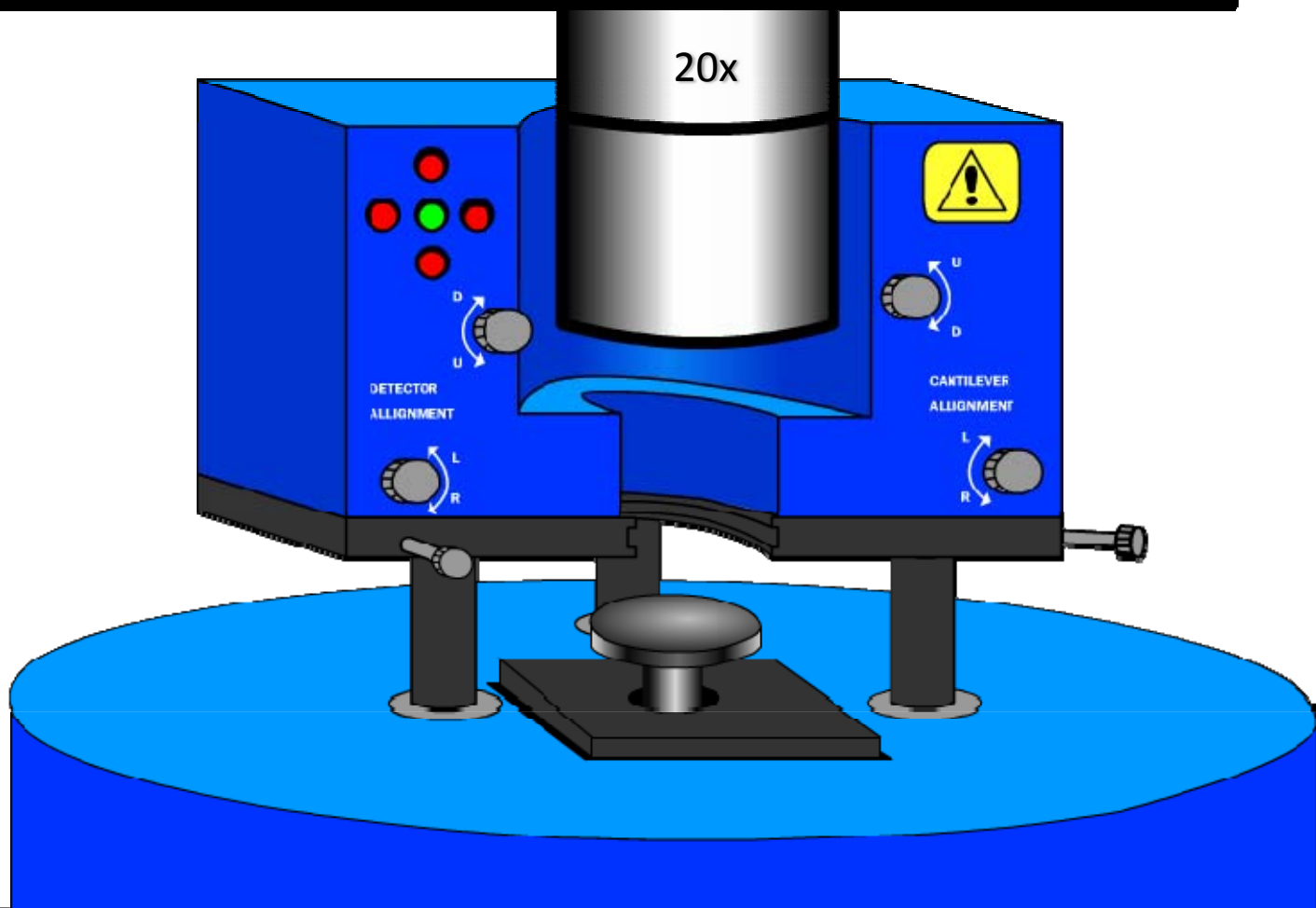


# Remote Connection



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# Remote Connection

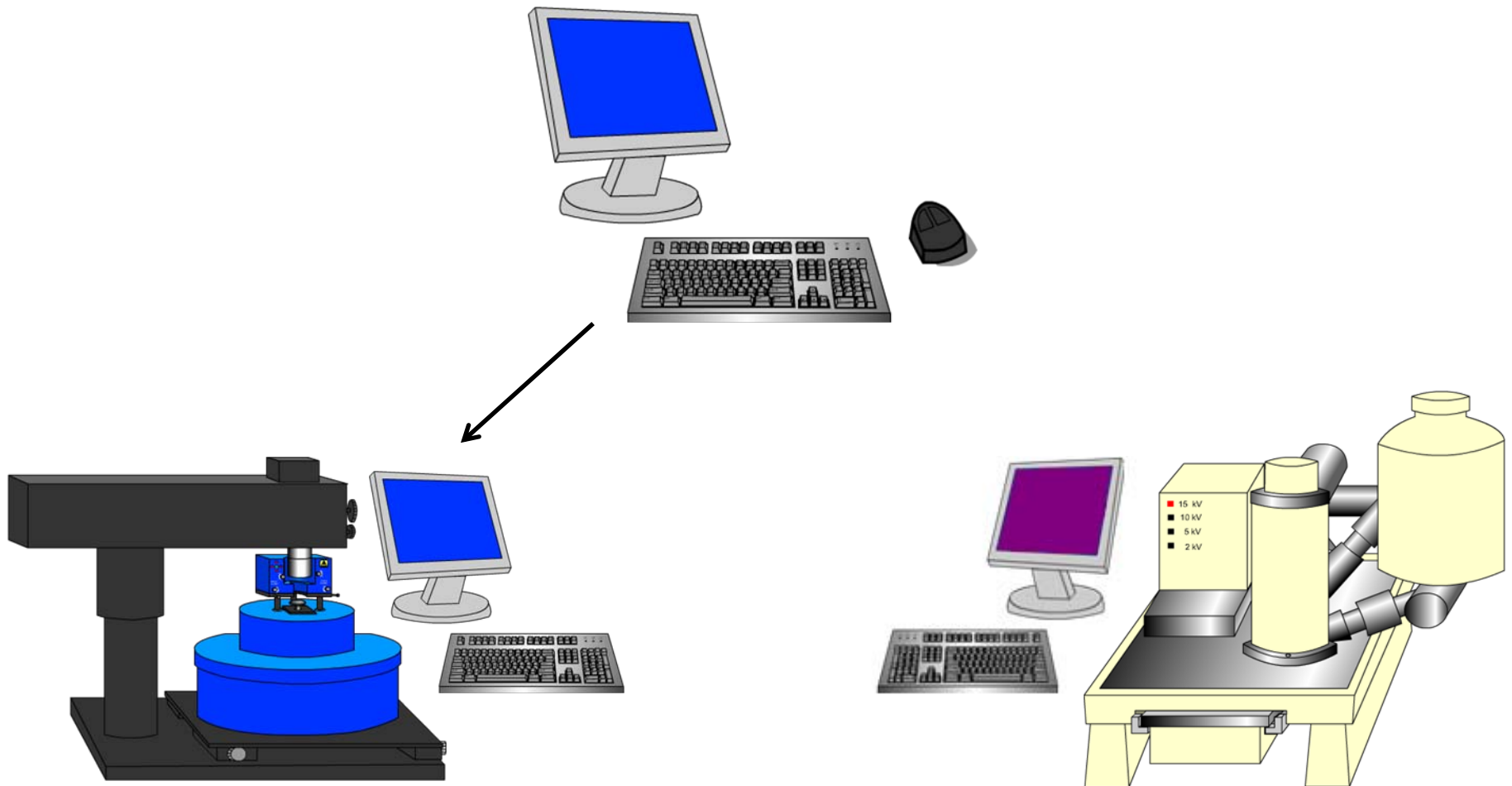


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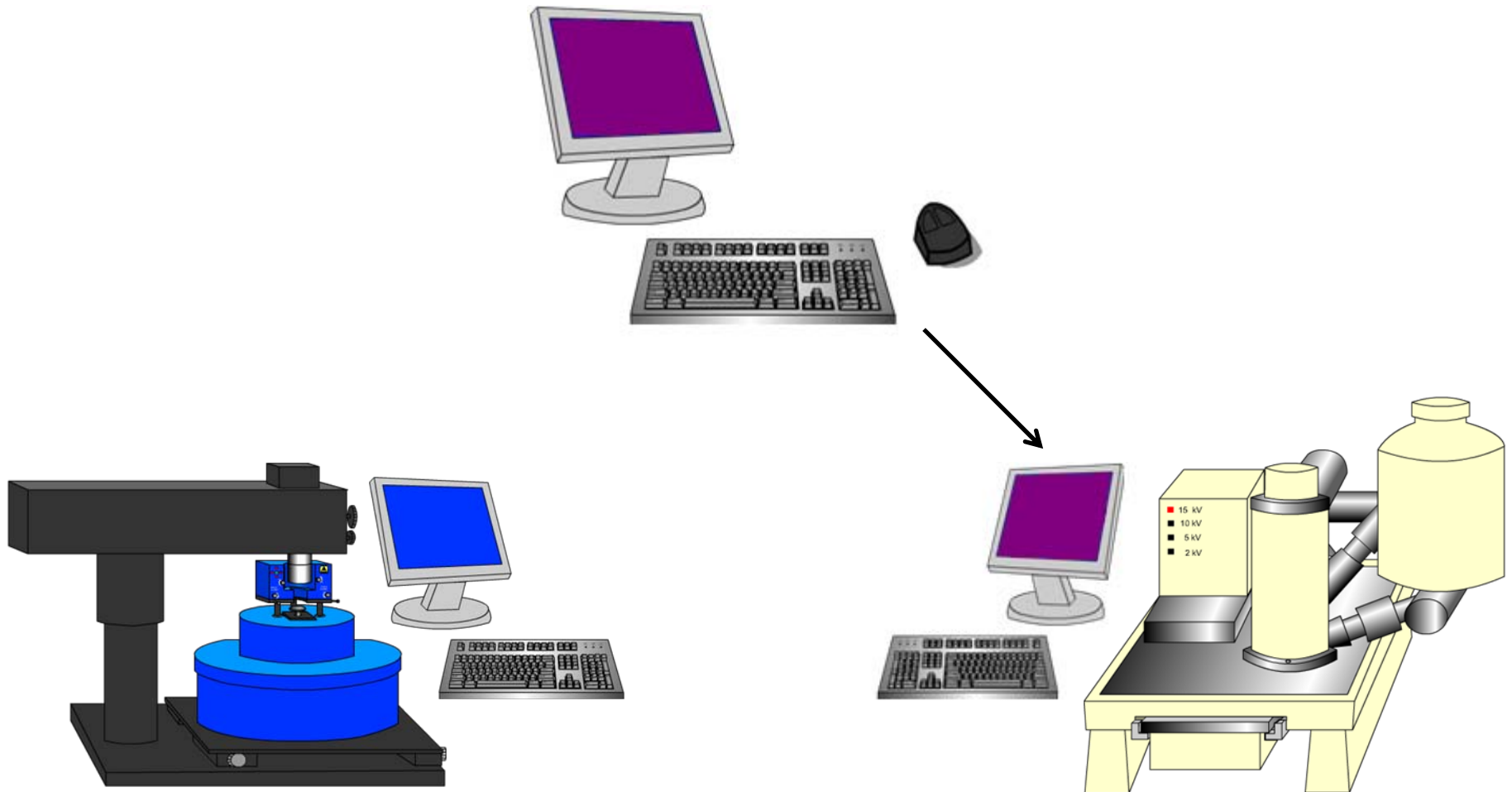




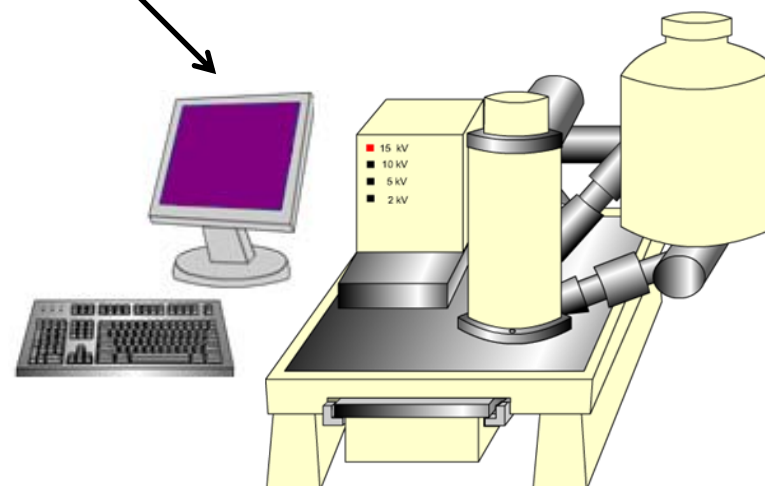
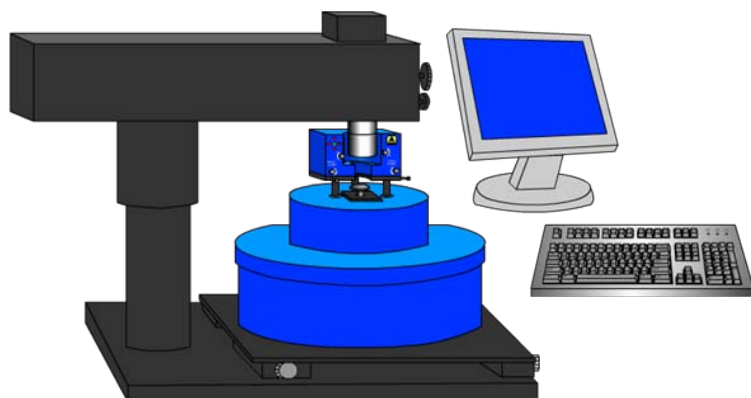
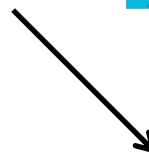
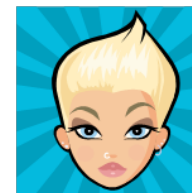
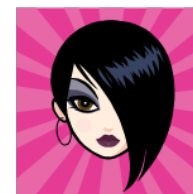
# Point to Point Transfer



# Point to Point Transfer



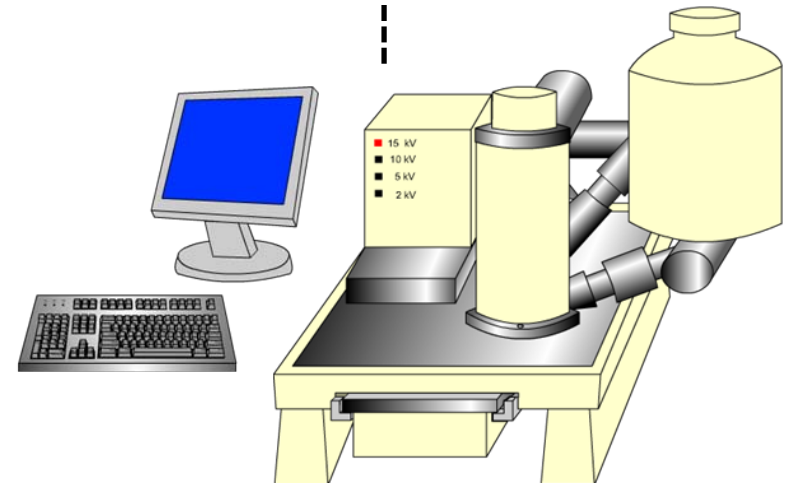
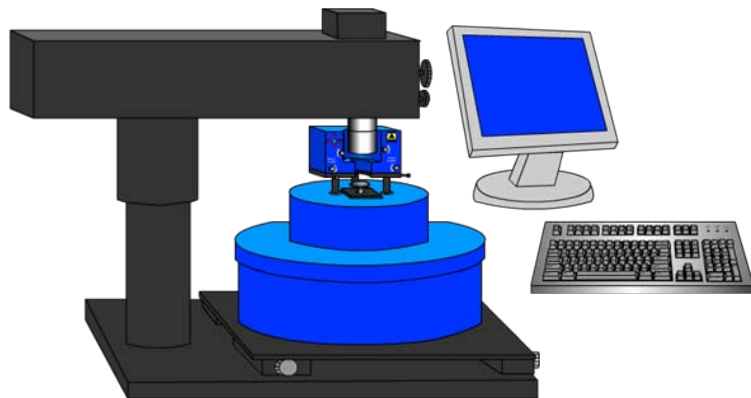
# Point to Point Transfer



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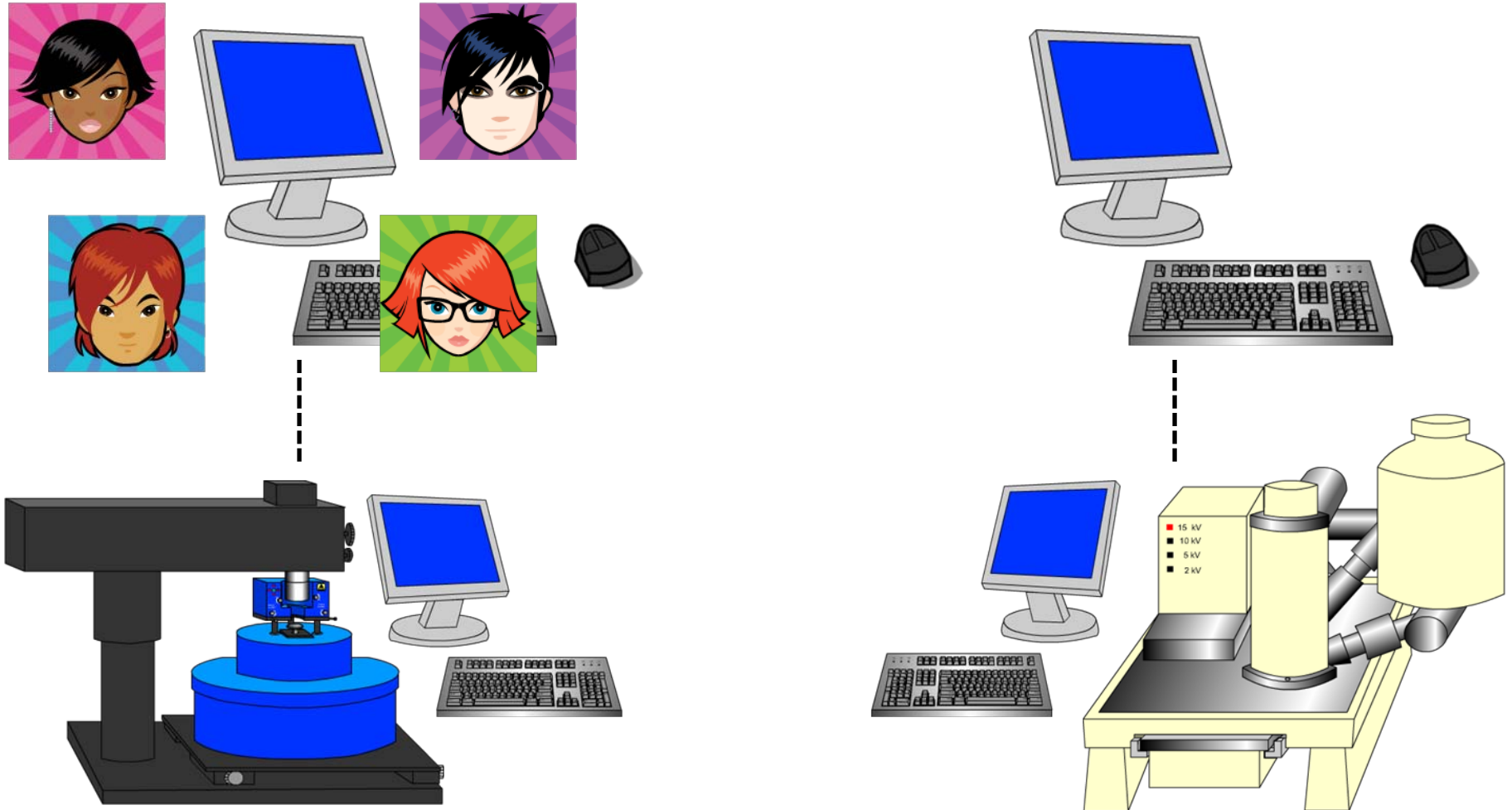
# Point to Point Transfer



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# Point to Point Transfer

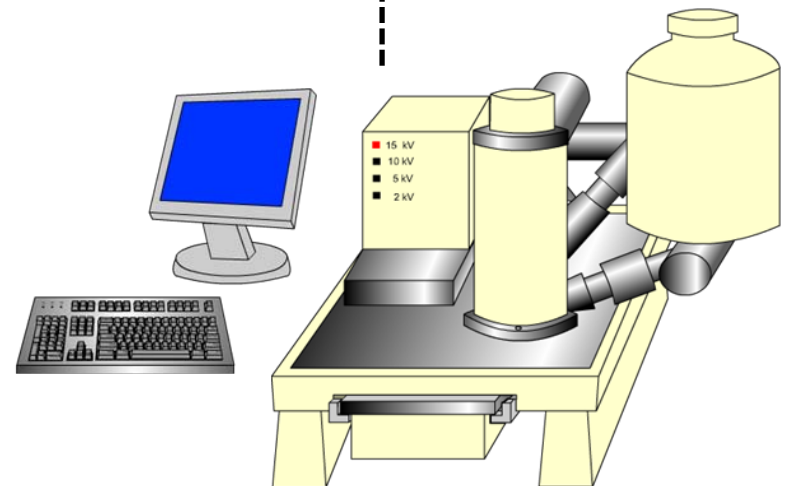
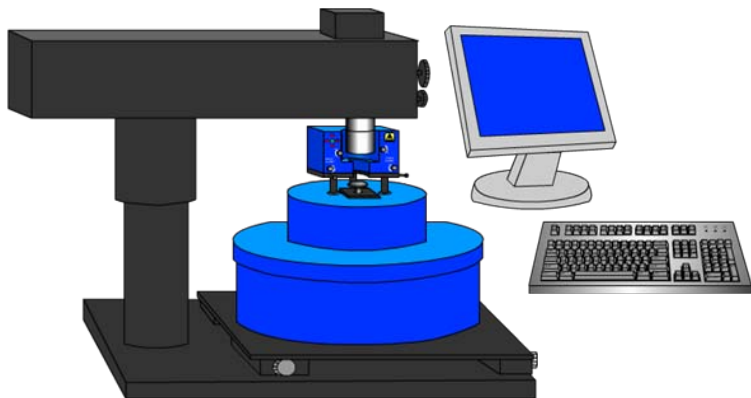


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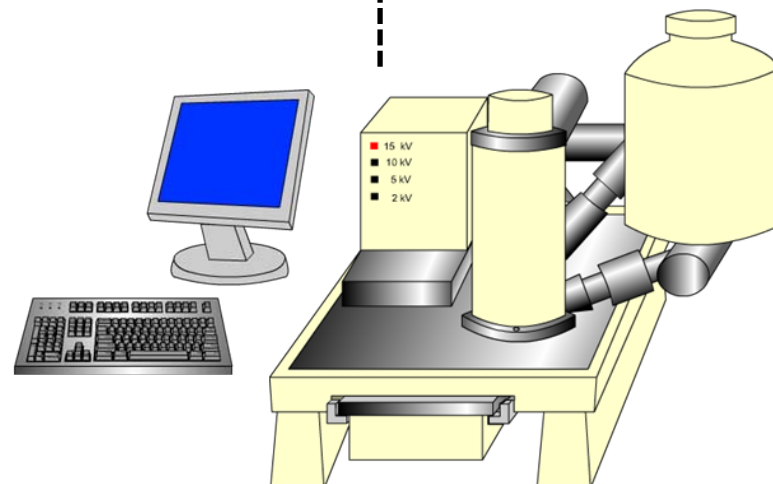
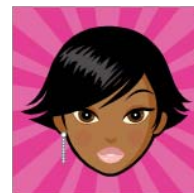
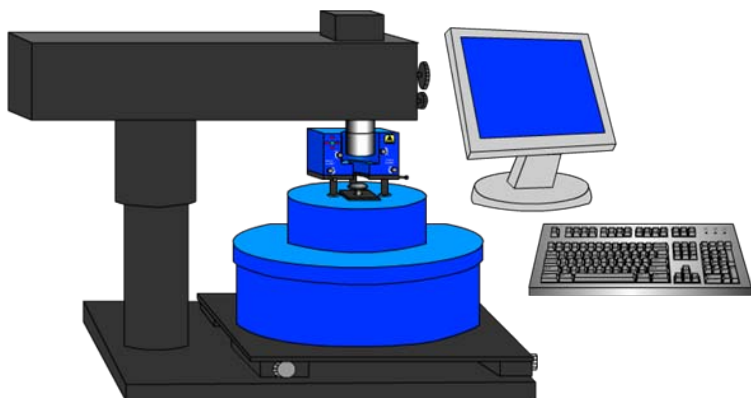
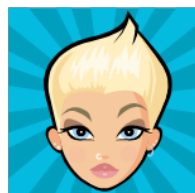




# Point to Point Transfer



# Point to Point Transfer



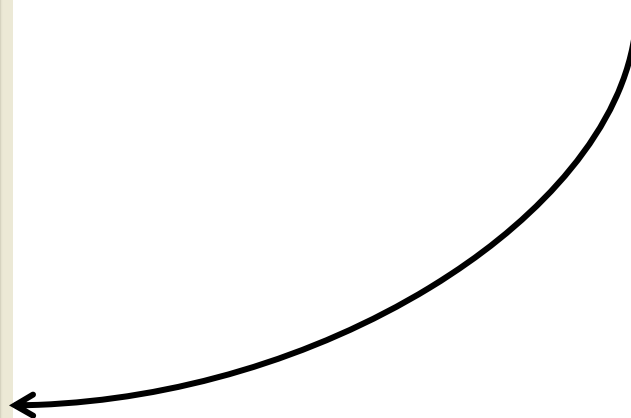
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# Questions or Comments

Type them in your chat window



# 2010 Remote Access Pilot Study

- Pre-participation survey



# 2010 Remote Access Pilot Study

- Pre-participation survey
  - <http://spreadsheets.google.com/viewform?formkey=dGd1R0VDNWtCWIFubWhucnMxNEtzUnc6MA>





# 2010 Remote Access Pilot Study

- Pre-participation survey
- Individualized plans for each participant
- Conference Call
- Ship Supplies
- Perform Test Runs
- Prepare for Lesson
- Remote Activity
- Evaluation



# 2010 Remote Access Pilot Study



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# Demonstration of Remote Access



# NACK Center Remote Access Contacts

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- Phone: 814-865-5285

Amy Brunner

- Email: [abrunner@engr.psu.edu](mailto:abrunner@engr.psu.edu)
- Phone: 814-865-8977





# What Resources are Available?

- <http://www.nano4me.org>
  - Here, you will find course notes, steps for holding a remote access session, laboratory exercises, educational modules used in the creation of this presentation, and much, much more!
- Many other resources available online.





# Upcoming NACK Workshops

April 12-14      Hands on Intro to Nano Workshop

May 10-13      Train the Trainer (211-212)

Aug 9-12      Train the Trainer (213-214)

Oct 4-7      Train the Trainer (211-212)

Nov 16-18      Hands on Intro to Nano Workshop



# Thank you for attending

## **NACK's Webinar**

### **Remote Access to Nano-Characterization Tools**

You may find additional resources and free curriculum for nanotechnology at [www.nano4me.org](http://www.nano4me.org) and click Educators.



# Webinar Recordings

To access this recording or slides, visit

[\*www.matecnetworks.org\*](http://www.matecnetworks.org),

Keyword Search:

“webinar remote access”

You may also find over 100 resources in the  
NetWorks Digital Library, keyword:  
nanotechnology



# NACK Upcoming Webinars

**March 26: Recruitment for Nanotechnology Enrollment**

**April 23: Building a Nano Lab: Equipment and Program Overview**

Visit [www.nano4me.org](http://www.nano4me.org) and click Educators and then the Webinar tab for more details about these and other upcoming webinars.





Join Us in Orlando, FL  
July 26-29, 2010

Visit [www.highimpact-tec.org](http://www.highimpact-tec.org) as more details develop

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# Certificate of Participation

If you attended the live version of this  
1.5 hour webinar and would like a  
certificate of participation, please email

**Kristen Robinson** at [kjrobinson@engr.psu.edu](mailto:kjrobinson@engr.psu.edu)



# How Can We Better Serve You?

Whether you are joining us live or watching the recorded version of this webinar, please take 1 minute to provide your feedback and suggestions.

<http://questionpro.com/t/ABkVkZGxde>



# Thank you for attending

## **NACK's Webinar**

### **Remote Access to Nano-Characterization Tools**

Hosted by MATEC NetWorks

Classroom Ready Resources in the Digital Library

TechSpectives Blog

Webinars

All this and more at [www.matecnetworks.org](http://www.matecnetworks.org)

