

ASSIGNMENT

IMAGING & RICHARD FEYNMAN

Course: Materials Characterization for Soft and Polymeric Materials

Institution: University of Notre Dame

Faculty: Gabriel Burks

Details about the audience and course context

- How many students are in the class? *Approximately 20*
- What is the teaching modality (in person, virtual, hybrid)? *In person*
- What grade level/year are the majority of students? *A mix of graduate and undergraduate students*
- Where does this course fall in the curriculum? (Is it in the core or organized within a particular course of study?) *This is currently an elective course, but it will undergo review to be added to the Materials Science Engineering Ph.D. program curriculum.*
- What virtues are integrated into the course? *Moral courage, intellectual wonder (curiosity), and intellectual attentiveness*

Assignment: Imaging & Richard Feynman

The course is divided into three blocks. For each block, students write responses to the “thought-provoking questions” in the associated online class discussion board and provide a thoughtful response to two of their peers.

It’s 1959. You walk into a packed lecture hall in Pasadena, California. The speaker is animated, smiling, bouncing. But what he’s about to say is nearly science fiction. He tells the audience there’s “plenty of room at the bottom.” He envisions a future where we could arrange atoms one-by-one, where we could see what was once invisible. No such tools existed then.

Feynman didn’t build microscopes.

He built questions that opened doors.

He believed that curiosity—not conventional logic—was the spark for discovery.

He believed asking “why not?” was more powerful than asking “how?”

Thought-provoking questions

- What if the limits of what you think is possible are actually just a reflection of the tools you've used?
- What happens when you imagine beyond your current lab equipment?
- As we study high-resolution and in situ EM, what new phenomena might we discover if we look with fresh eyes?
- What part of this subject seems confusing now—but might just be awaiting your next curious question?
- When analyzing scattering data or structural models, how do we honor the integrity of what we see versus what we want to see?

Note to Instructors

As the instructor, the prep is pretty fun for the exemplar portion. I add a bit more historical context and include news clippings and nontraditional media to demonstrate not only the story of the exemplar but the personality of the exemplar.