

Those of us who live in this amazing world of science and engineering have got to pay more attention how to speak to the public.

I am convinced one approach is to embrace the value of the visual-- that when we find better vocabularies to express complicated ideas, there will be less confusion across the globe about how to make critical decisions that will affect our health and our planet, to educate all our cultures on how to distinguish between opinion and fact.

One approach is to engage the public in our conversations.

And we can do that creating honest, accessible, compelling, even beautiful images of our research so that our work will become less intimidating, where your mother or father will not be embarrassed to ask questions about the images they see of your work.

That's part of the philosophy of this course, in case you didn't notice.

But so much of what we do in our labs is difficult to explain.

So first, here's where I'd like to briefly touch on the potential of visual metaphors.

For example, you've seen this music box throughout this course.

I made the image for our book "No Small Matter" to engage the reader to think about the language of computation, a binary language, either on or off, as this music box's clever system works.

It's either one or zero.

Take a good look and think about it.

Here's another one of these metaphors along the same thinking of explaining binary language.

These are small drinking glasses viewed from above.

The ones filled with red (good shiraz, by the way!) represent one in this binary system.

The empty glasses represent zero.

Again, for the book, "No Small Matter." The first row across represents 12 in our everyday number system.

If we add the second row, 22, the result in the third row is 34.

12 plus 22 equals 34.

Here's another you've seen before.

We call it etching with light, suggesting how some surfaces we work with in the laboratory can be etched with various patterns.

And here, this cascade could suggest how the flow of electrons change from one energy state to another.

Here's one I think that works quite well.

These graduation chairs are lined up basically to guide parents where to sit.

It's a metaphor for something called templated or guided self assembly.

Just as when DNA replicates itself, each of its strands guides the distribution of bases for the new strand.

Here's one that I did love making, but maybe it doesn't quite work enough.

I wanted to show the counterintuitiveness of quantum mechanics.

Now, look at the shadow on the right.

It doesn't make sense, right?

In fact, that square shadow is impossible.

I made it with software.

And so it is with quantum mechanics-- so much of the quantum phenomena simply just makes no sense at all.

Here's one from the Fermilab which I thought was quite clever.

Take a guess at what this jelly bean jar is metaphorically representing.

Take a moment.

And the fact that it's from Fermilab is a big hint.

So here's that information in a pie chart-- of course, more quantitative.

We are seeing the distribution of dark energy, dark matter, and everything else in the universe.

I think we pay more attention to the jelly bean jar.

Do you?

What do you think?

Now, none of these visual metaphors work completely on their own.

First, we need some sort of text to help us look and think about it.

And most important, all metaphors fall apart at some point.

And that conversation of where they fall apart can be a powerful place to talk about the science.

I encourage you to start thinking about creating metaphoric photographs that teach the non-expert how to start thinking about various scientific phenomena.

OK.

Let's switch gears and look at just a few simpler ways to engage the public with our images.

How about using some of your new wonderful images of your work for cards, or announcements, or posters?

Could be fun thinking about it.

The images you will begin making after this course will be pretty compelling.

I'm sure of it.

Why not show them off outside the research community?

All I suggest is to think about ways to incorporate some of your amazing new images in ways to excite the public.

And who knows?

Someday, you might even get an exhibit along the Champs-Elysees.

What do you think?