

Nobel Lindau essay, John Mather, 2012 December, ~5000 characters

Title: Learning by Viewing – Nobel Labs 360

Link:

[http://www.lindau-nobel.org/Nobel Labs 360 About the Project.AxCMS?ActiveID=2582](http://www.lindau-nobel.org/Nobel%20Labs%20360%20About%20the%20Project.AxCMS?ActiveID=2582)

First of all, my thanks to the Nobel Lindau Foundation for their inspiration and leadership in sharing the excitement of scientific discovery with the public and with future scientists! I have had the pleasure of participating twice in the Lindau meetings, and recently worked with the Nobel Labs 360 project to show how we are building the world's greatest telescope yet, the James Webb Space Telescope (JWST).

For the future, I see the greatest challenges for all the sciences in continued public outreach and inspiration. Outreach, so the public knows why we are doing what we are doing, and what difference it makes for them today and in the long-term future. Who knows what our destiny may be? It could be glorious, or not, depending on how we all behave. Inspiration, so that the most creative and inquisitive minds can pursue the scientific and engineering discoveries that are at the heart of so much of human prosperity, health, and progress. And, of course, national and local security depend on those discoveries too; scientists have been working with "the government" throughout recorded history.

For the Lindau Nobel experiment, we have a truly abundant supply of knowledge and excitement, through the interactions of young scientists with the Nobelists, and through the lectures and the video recordings we can now share with the whole world across the Internet. But the challenge is always to draw attention! With 7 billion inhabitants on Earth, trying to earn a living and have some fun, there are plenty of competing opportunities and demands on us all. So what will draw attention to our efforts at Lindau?

These days, word of mouth has become word of (computer) mouse, and ideas propagate as viruses (or memes) across the Internet according to the interests of the participants. So our challenge is to find and match those interests, so that the efforts of our scientists, photographers, moviemakers, and writers are rewarded by our public. The world changes every day, so there is no one way to go, and everything is an experiment – sounds scientific, yes?

I think our partnership with Volker Steger in the Nobel Labs 360 is one of the most interesting I have seen. Computer viewers can see our scientific habitats and begin to experience being there in person, panning a viewpoint up, down, and all around us, and seeing or hearing explanations of what we are doing. For my part, I was photographed in my office and in the giant clean laboratory where we are building the James Webb Space Telescope (JWST). It's an extraordinary thing to be there; the

number of people who will go there in real life is probably less than a hundred, even though well over a thousand engineers are designing the telescope, 10,000 astronomers will use it, and billions of people will see what we find with it.

Here at NASA we are experimenting with the social media; our experts tend to be much younger than the Nobelists! But we have huge numbers of followers of JWST and the Hubble Space Telescope on Twitter and Facebook, and I did a Reddit AMA (ask me anything) that was very popular too. We are clearly seeing rapid evolution of the social media as the herd thunders here and there. Some things “go viral”, and I’m sure there’s an art and science of learning how to do that intentionally. I know advertisers are studying the topic quite diligently, for their commercial reasons, and I think scientists need to do the same.

Is the Nobel Labs 360 a success? I certainly think so technically; I love panning around the labs that are online already, and clicking on the links to explanations. And our Goddard Space Flight Center photographer who worked with Volker wants to get one of those cameras and the supporting equipment and software, so we can do these kinds of immersion presentations too. My only worry is about whether the beautiful work is being followed by the young scientists who come to Lindau, and by the rest of the world. I don’t know how to measure this, but I think it’s important to know who is following us and how we can serve them as well as we can.

Here in the US, I heard Dean Kamen (the famous inventor of the Segway and many other things) talking about why he started the FIRST Robotics competition. Titled “The varsity Sport for the Mind,” the competition draws on the natural desire of young people to compete and be rewarded for it. Billions of people follow professional sports, so how about something that excites that degree of interest in science and technology? Kamen told us that there is plenty of supply of scientific and engineering information already, and what we need is more demand. His robotics competition does something about it, as do the various science and mathematics Olympiads around the world. Perhaps, the Lindau Nobel work can tap into that same competitive process. People already know the Nobel prize as a competition, but it seems out of reach for them personally; Nobel scientists are sometimes seen as a bit like extraterrestrials, far from the comprehension of ordinary humans. If we could share our lives and our perspectives more widely, that would be a great challenge, with a great reward.