

Lawrence Livermore National Laboratory

**Homeland Security Taskforce
Report**

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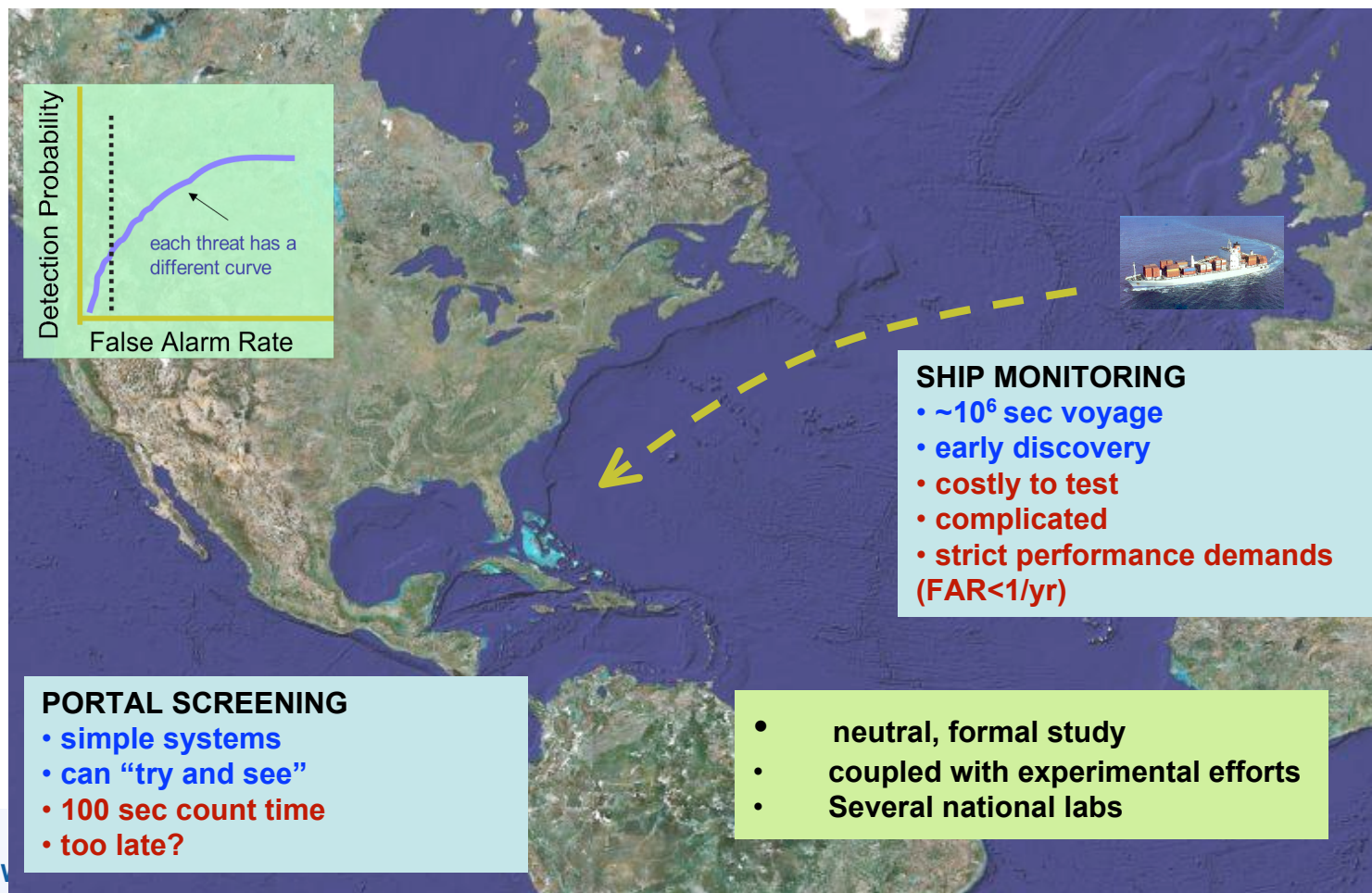
What is this all about?

- Four parts to security
 - Safeguards -- keeping the stuff out of the wrong hands
 - Smuggling detection -- finding it if it gets away and keeping it out if you can
 - Response and operations -- taking care of the mess if something happens
 - Assessments and attribution -- whodunit??
- USNDP work addresses points 2 and 4 most directly
- Assessment work is broad and reaches beyond DHS issues:
 - Proliferation risks
 - Energy infrastructure
 - Nonproliferation -- weapons and fuel cycle
 - Evaluation of industry-government partnership plans and ideas
- This talk covers some recent developments and proposes some news ideas about how to expand the field to deal with future needs



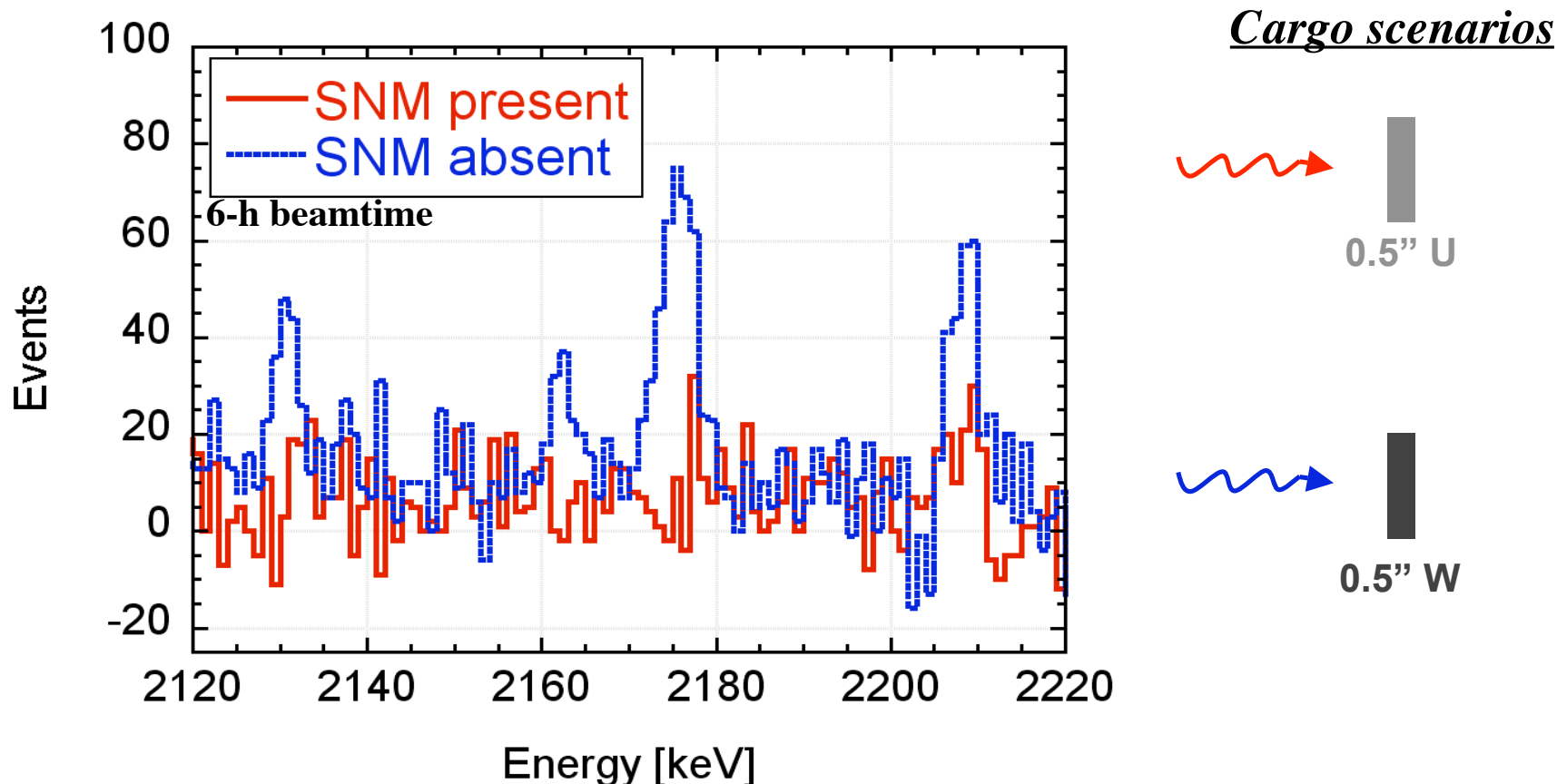
What have we done for you lately? I

Homeland Security funded assessment of onboard radiation detection
-- What is the best architecture to address such monitoring and detection?



What have we done for you lately? II

Scanning cargo containers for SNM smuggling with detector made of same material you search for
-SNM target absorbs gammas of a particular energy, gammas pass through non-SNM target



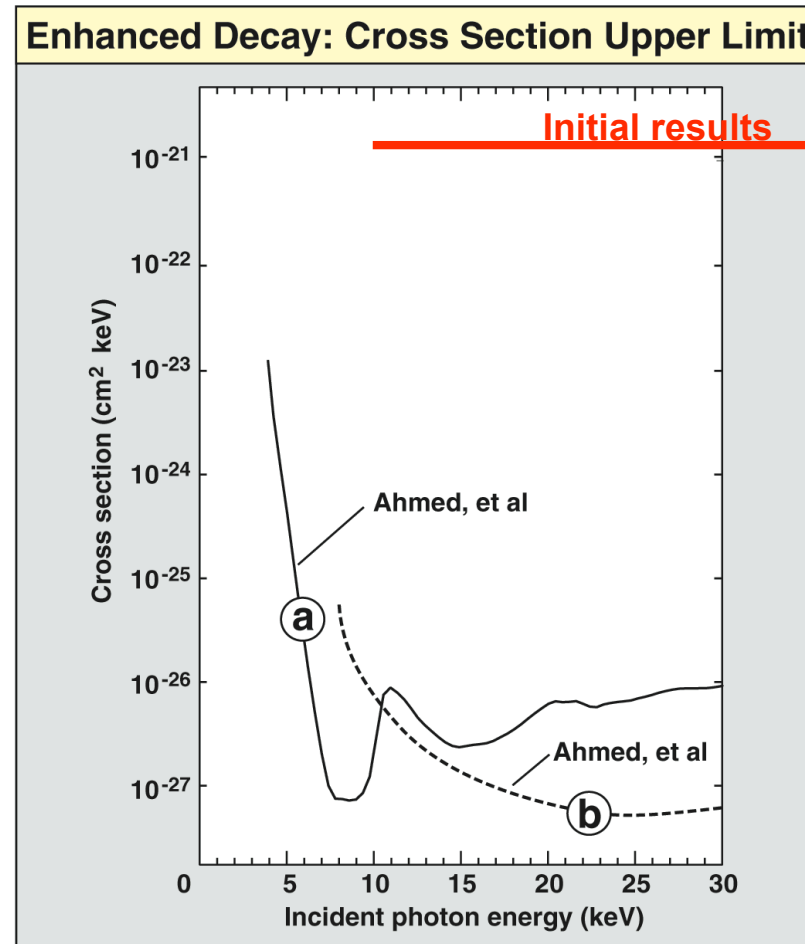
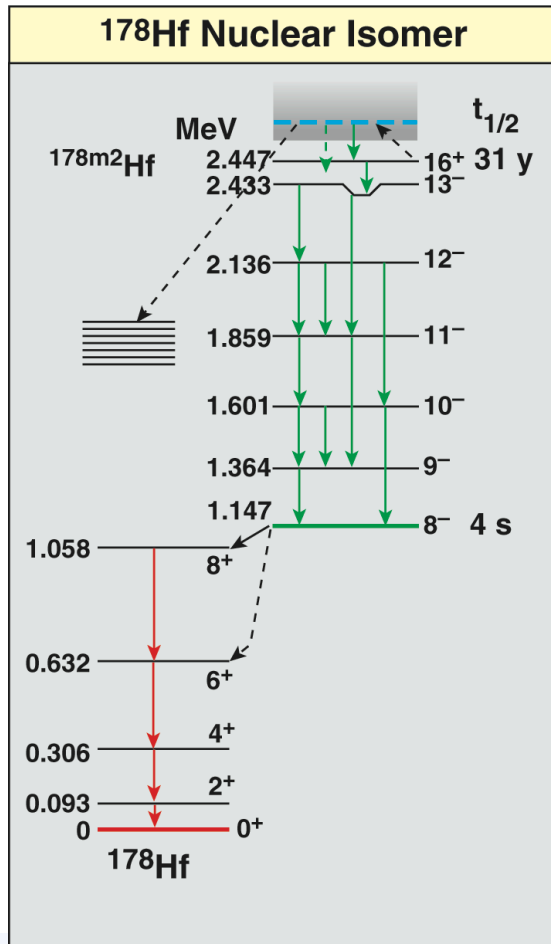
HIGS provides $\sim 10 \gamma/\text{eV}/\text{s}$ \rightarrow T-REX goal is $10^8 \gamma/\text{eV}/\text{s}$



What have we done for you lately? III

^{178}Hf isomer suggested as new energy source

- Collaboration between ANL, LANL and LLNL showed no credible evidence for enhanced decay



How to provide for future assessment capabilities?

- Some of the advances shown here were made by people who were trained in different areas of nuclear physics but retrained by the labs
- More young people needed in the field -- we aren't getting any younger
- We need strategies to provide people and infrastructure in the future -- need isn't going to go away
- Providing the training and workforce capabilities has to be part of the picture
- Need to think outside the fiefdom!



How to address DHS (and other) data needs for the future?

- Not enough students are being trained in low energy nuclear physics these days, especially in theory -- it isn't "sexy" for students or campuses
- Past paradigm: take good people trained in other areas of nuclear science, bring them to national labs, give them an interesting problem to work on and retrain them plus some chance to do independent research as a bonus -- requires time and patience to bring them along but then they thrive!
- Corporatization of labs will make this paradigm obsolete
- What to do then? -- Need to start from the university level and for that you don't just need to make it interesting for students but for the campus as well (DHS has partnered with NSF to provide student support but these students need advisors)



Possible model: RIKEN-BNL Institute at BNL

- RIKEN saw need for theory support for heavy-ion and spin programs at RHIC
- Sponsored assistant professor positions at universities (1/2 FTE cost carried by RIKEN-BNL for five years)
- Similar lab-DHS-university partnerships could promote nuclear theory positions at universities to train new people in areas of basic research in nuclear theory related to non-proliferation, risk assessment, energy etc.
- New faculty for such positions likely to be found outside the US (Europe and Japan)
- Propose a Taskforce report to study this issue and make concrete suggestions for how to fix it

