

Lessons and Highlights from Blended Physics Courses

Saif Rayyan

Lecturer, Physics Department

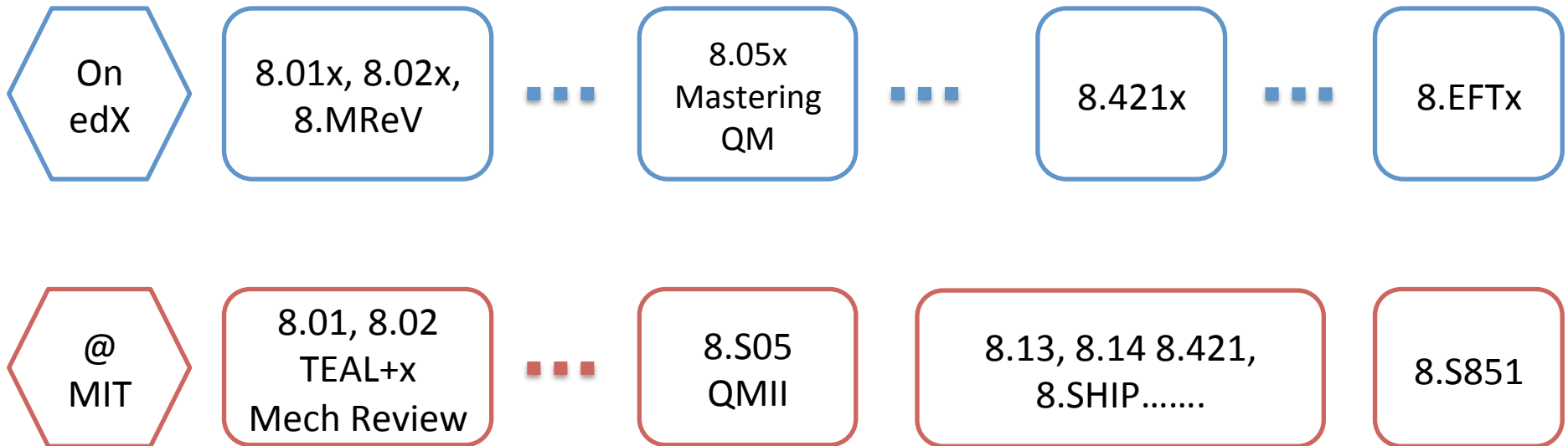
Digital Learning Lab Scientist, ODL



Blended @ Physics

- 1. MOOCs should be aligned with Residential Courses.**
2. Blended/Flipped/Online Classes Increase Flexibility of Advanced Course Offerings.
3. Immediate Feedback is Essential to Blended Learning, and Students Approve.
4. Blended Learning Should Increase Interactive Engagement, and Encourage Good Study Habits.
5. The Right Tools Enable Better Instruction.

Align MOOCs with residential courses



- 8.01: Physics I
- 8.02: Physics II
- 8.05: Quantum Mechanics II
- 8.13: Junior Lab I
- 8.14: Junior Lab II
- 8.421: Atomic Physics (Graduate)
- 8.SHIP: School of Heavy Ion Physics (Graduate)
- 8.851 (EFTx): Effective Field Theory

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New Model of Course Offerings

- Lectures are replaced by Interactive Learning Sequences (video/checkpoint exercises/tutorials)
- Homework is Done Online.
- Keep Recitations/ Interactive Face time.

- 8.S05 Quantum Mechanics II: Additional Spring Offering (Spring 2015, Spring 2016).
- 8.S421 Atomic and Optical Physics: (Fall 2015)
- 8.S851 Effective Field Theory: (Fall 2014 + Self Study)

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8.02 Spring 2014
 Week 11 Survey (573 responses)

N/A (Not used) Not Helpful Somewhat Helpful Moderately Helpful Very Helpful Extremely Helpful

Reading Summaries (at the beginning of Pre-class assignments)



Pre-Class Questions



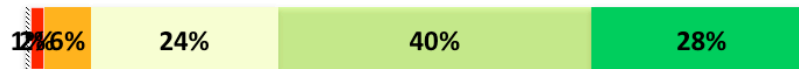
Online Problems Submitted on MITx



Checkable answers on MITx for written Pset problems



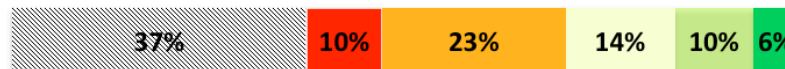
Submitted Written Psets



Readings from the textbook



Piazza



Walter Lewin Lectures



TEAL simulations on MITx



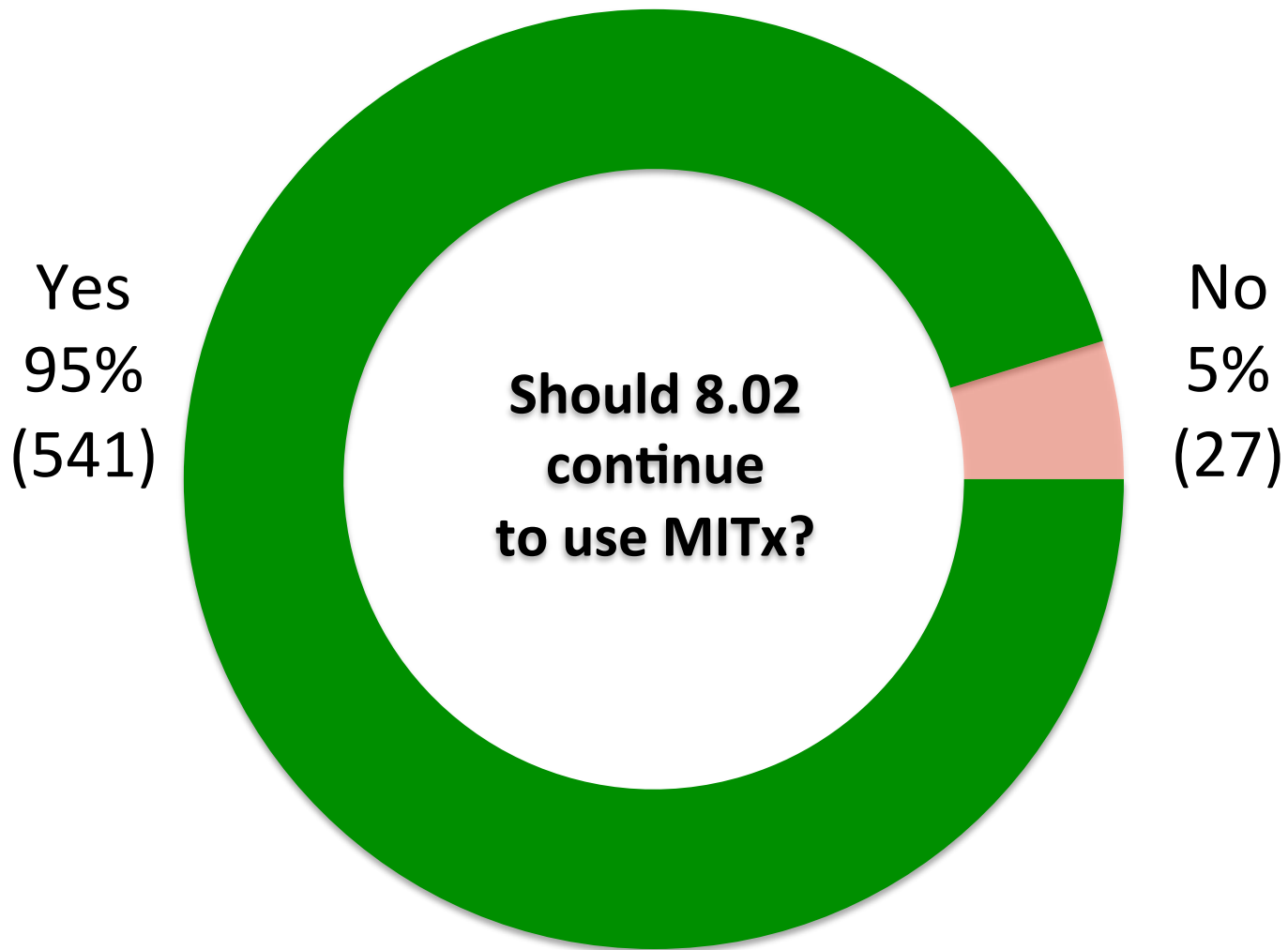
8.02 Spring 2014

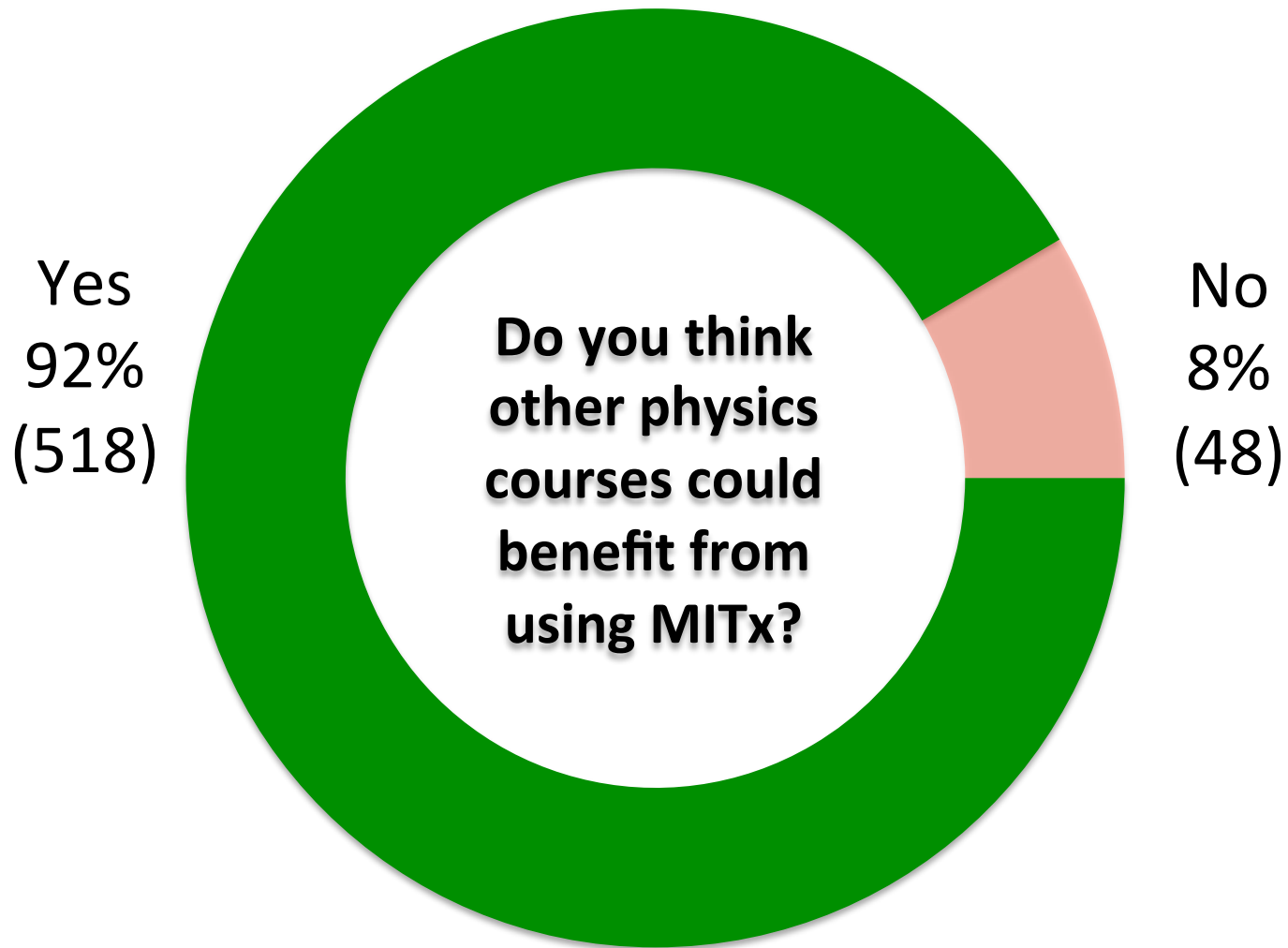
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Checkable answers on MITx for written Pset problems



http://web.mit.edu/fnl/volume/272/rayyan_belcher.html





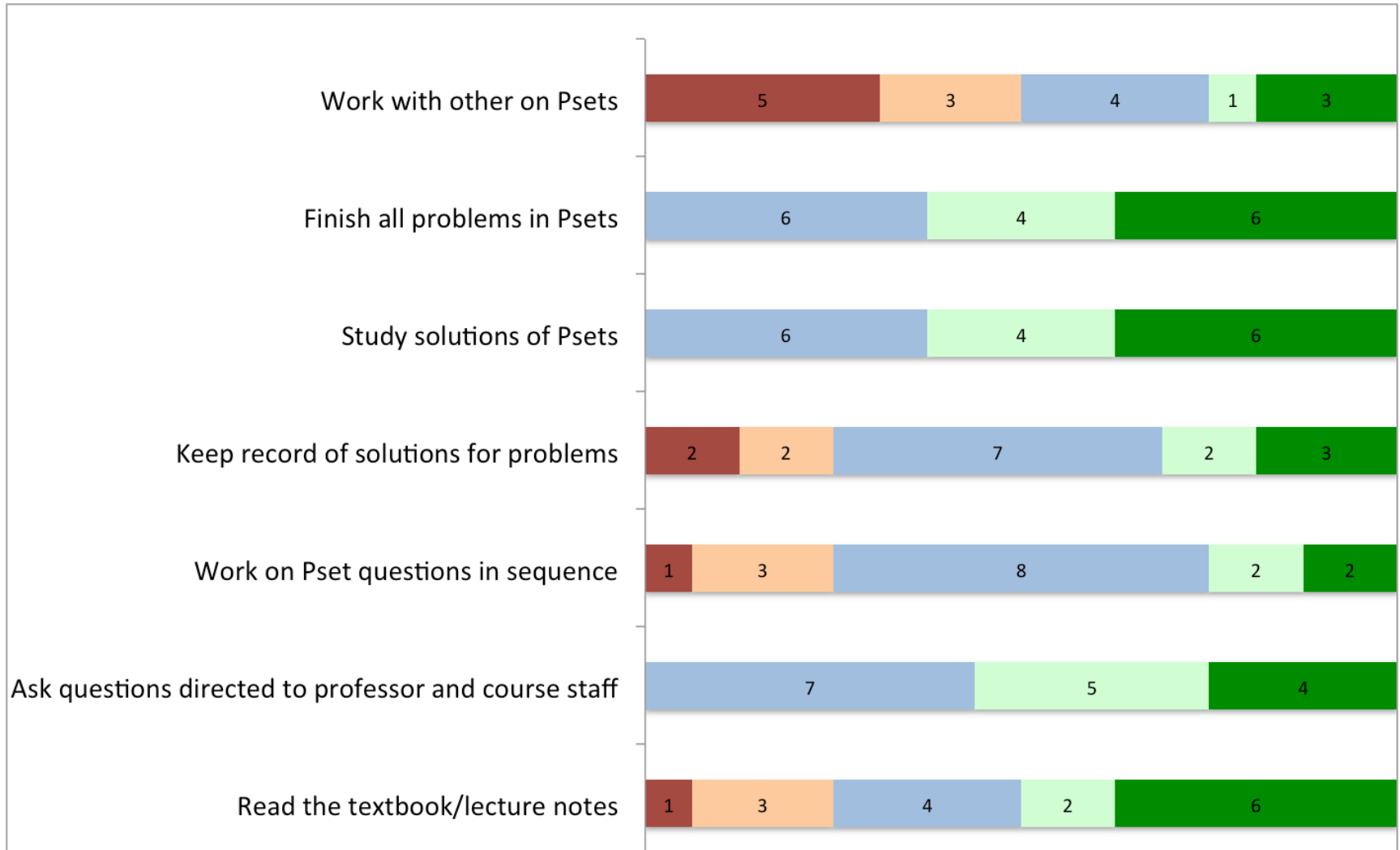
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8.01 TEAL(Technology Enabled Active Learning)

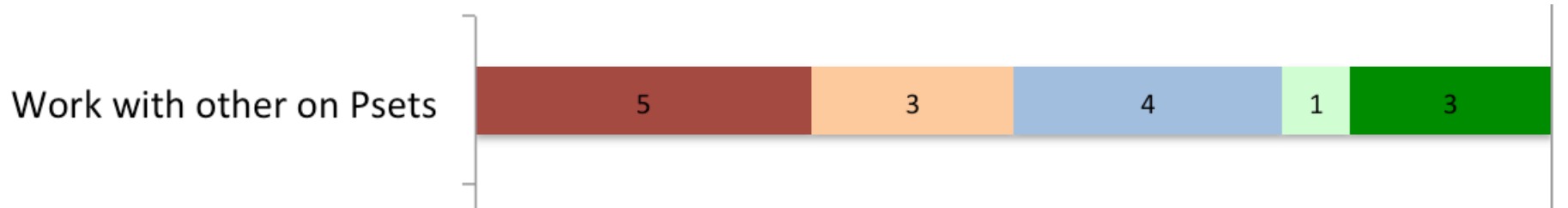


8.S05- (16 responses) Q: Compared to other courses you have taken at the physics department at MIT (e.g. 8.04), would you say that you did more or less of the following:



■ Much More in traditional courses
 ■ More in traditional courses
 ■ about the same
 ■ More in 8.S05
 ■ Much more in 8.S05

8.S05- (16 responses) Q: Compared to other courses you have taken at the physics department at MIT (e.g. 8.04), would you say that you did more or less of the following:



■ Much More in traditional courses ■ More in traditional courses ■ about the same ■ More in 8.S05 ■ Much more in 8.S05

“I definitely worked with other students more in 8.S05 than in most of my other courses. I want to make it clear that this wasn't because we all got together and copied each other's work or something - we were very honest about not sharing solutions. But, it was much more helpful to work with other people because we could explain to each other a question and we would know that we were thinking about it correctly. In other classes, it is often the situation where several different people have different answers and aren't able to articulate why their method is better than the others. You might think that would lead to great educational debates, but in reality it just leads to frustration and often skipping the question and just working on it alone because you don't want to argue with people. “

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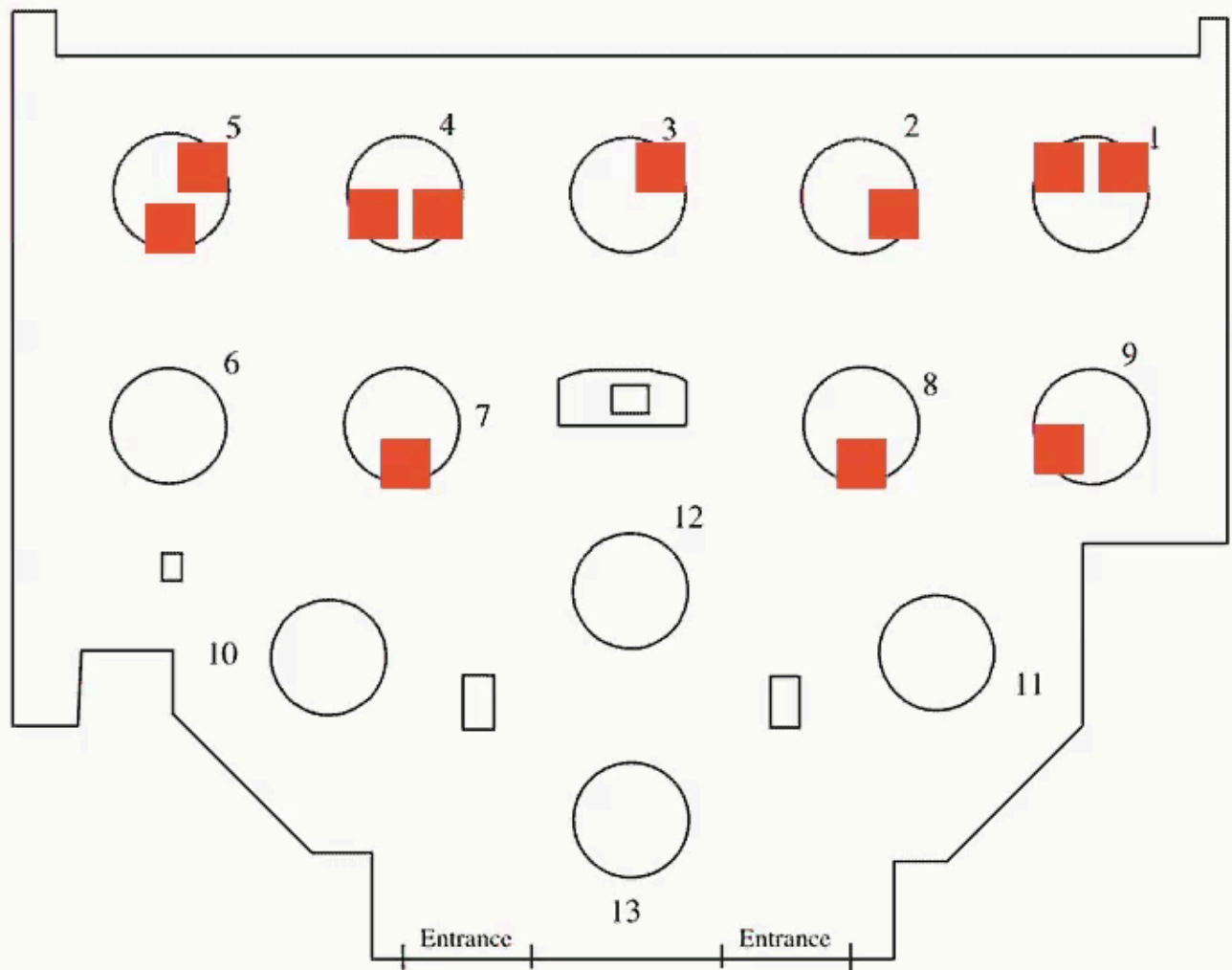
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Thanks to

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Krishna Rajagopal

Lori Breslow (and TLL)

Zhongzhou Chen

Analia Barrantes

Michelle Tomasik

Barton Zwiebach

Jaehoon Lee

Iain Stewart

Daniel Kolodrubetz

And many many more....