Preparing science for AI:
Rethinking education, discovery and dissemination

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Rethinking discovery
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Building AI is a process of “Exploration” not of “Understanding”
Rethinking discovery

The data *is* the model
Rethinking discovery

“Why?” is less important than “does it work?”
Rethinking discovery

Simplification is being replaced by “complexification”
Rethinking dissemination
Rethinking dissemination

Peer review can no longer depend on understanding
Rethinking dissemination

Reproducibility is central
Rethinking dissemination

The three requirements of future publication:

• Narrative
• Code
• Data
Rethinking education

Getting students ready for computational thinking
Rethinking education

http://computerbasedmath.org/
What does it mean to “do maths”? 
1. **DEFINE QUESTIONS**

2. **TRANSLATE TO MATH** (real world → maths)

3. **COMPUTE ANSWERS**

4. **INTERPRET RESULTS** (maths → real world)
1. **DEFINE QUESTIONS**

2. **TRANSLATE TO MATH**

3. **HAND CALCULATING**

4. **INTERPRET RESULTS**
Consequences of CBM

Focus on concepts not mechanics
Order by conceptual, rather than computational, complexity
Work with real problems (real scale, real mess, less contrivance)
Real-world driven outcomes…
What are the priorities for policy?

Fix education
Fix dissemination