Writing for mathematicians

(and other people too)

also of interest (soon): specifics of the grant application process at UGA

- budgets and budget justifications
- research statements, vitae
- broader impacts
- internal timelines and approval processes
- mechanics of grant reviewing at NSF (and other agencies?)
- for now (until next meeting): we recommend you work on research statements!

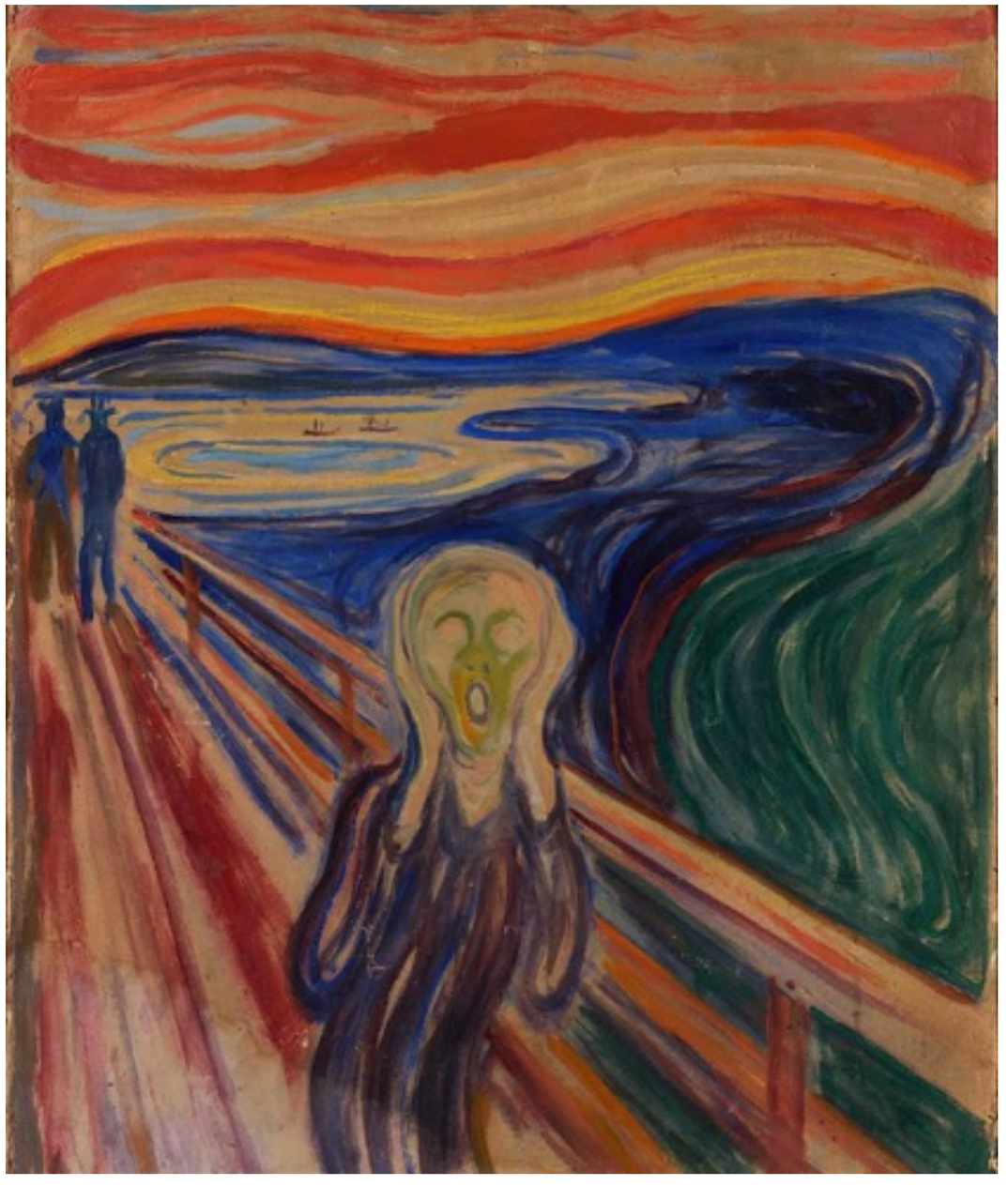
The key in writing: consider your audience

- Humans act in generally predictable patterns
- Anticipate their concerns and motivations

How do people react?

The stages of grief

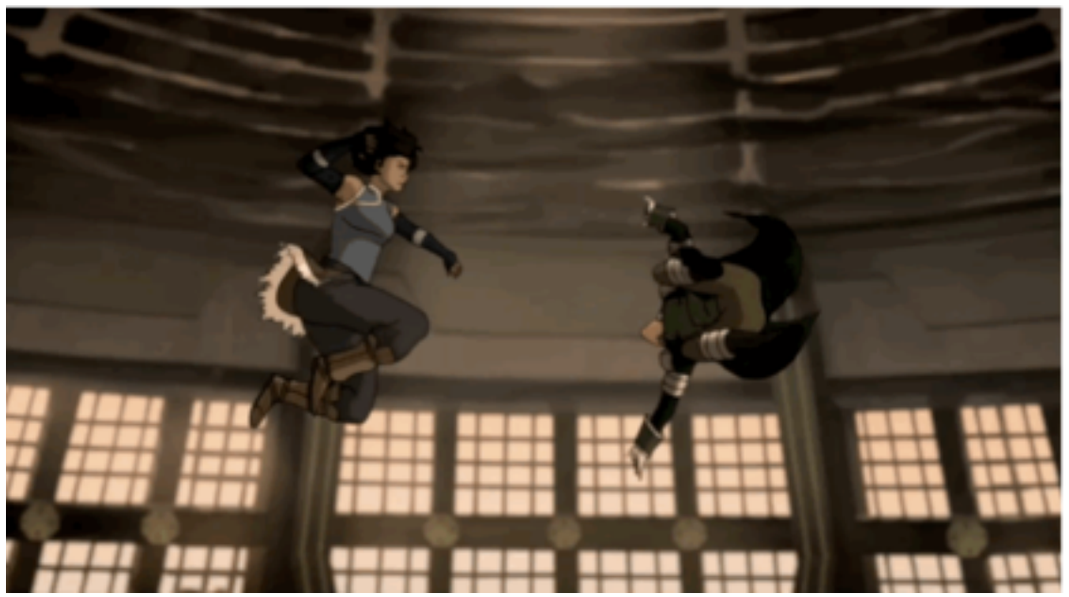
- denial
- anger
- bargaining
- depression
- acceptance



Similar patterns show up in other areas

Dealing with discomfort/ challenges in our environments

- ignore
- avoid
- attack
- co-exist



academia?

stages of scientific ideas

- I don't understand it
- I understand, but it's not interesting
- It would be interesting, but its wrong
- Its not wrong, but its too easy
- It's not too easy, but it's already been done
- Acceptance?

Broken bridges: A counter-example of the ER=EPR conjecture

Pisin Chen[a,b,c,d*], Chih-Hung Wu[a,b†] and Dong-han Yeom[a‡]

[a] *Leung Center for Cosmology and Particle Astrophysics, National Taiwan University, Taipei 10617, Taiwan*

[b] *Department of Physics, National Taiwan University, Taipei 10617, Taiwan*

[c] *Graduate Institute of Astrophysics, National Taiwan University, Taipei 10617, Taiwan*

[d] *Kavli Institute for Particle Astrophysics and Cosmology, SLAC National Accelerator Laboratory, Stanford University, Stanford, California 94305, USA*

In this paper, we provide a counter-example to the ER=EPR conjecture. In an anti-de Sitter space, we construct a pair of maximally entangled but separated black holes. Due to the vacuum decay of the anti-de Sitter background toward a deeper vacuum, these two parts can be trapped by bubbles. If these bubbles are reasonably large, then within the scrambling time, there should appear an Einstein-Rosen bridge between the two black holes. Now by tracing more details on the bubble dynamics, one can identify parameters such that one of the two bubbles either monotonically shrinks or expands. Because of the change of vacuum energy, one side of the black hole would evaporate completely. Due to the shrinking of the apparent horizon, a signal of one side of the Einstein-Rosen bridge can be viewed from the opposite side. We analytically and numerically demonstrate that within a reasonable semi-classical parameter regime, such process can happen. Therefore, the ER=EPR conjecture cannot be generic in its present form and its validity maybe restricted.

* pisinchen@phys.ntu.edu.tw
† b02202007@ntu.edu.tw
‡ innocent.yeom@gmail.com

You must communicate

- What you are doing
- Why it is interesting
- Why it is plausible (evidence)
- Why it is hard
- Why it is new
- Why you will be able to do it

How to say these things

- repeatedly — all points addressed in first page/ paragraph/sentence

- increasing detail and evidence within smaller sections

- don’t obfuscate. be clear

examples…