

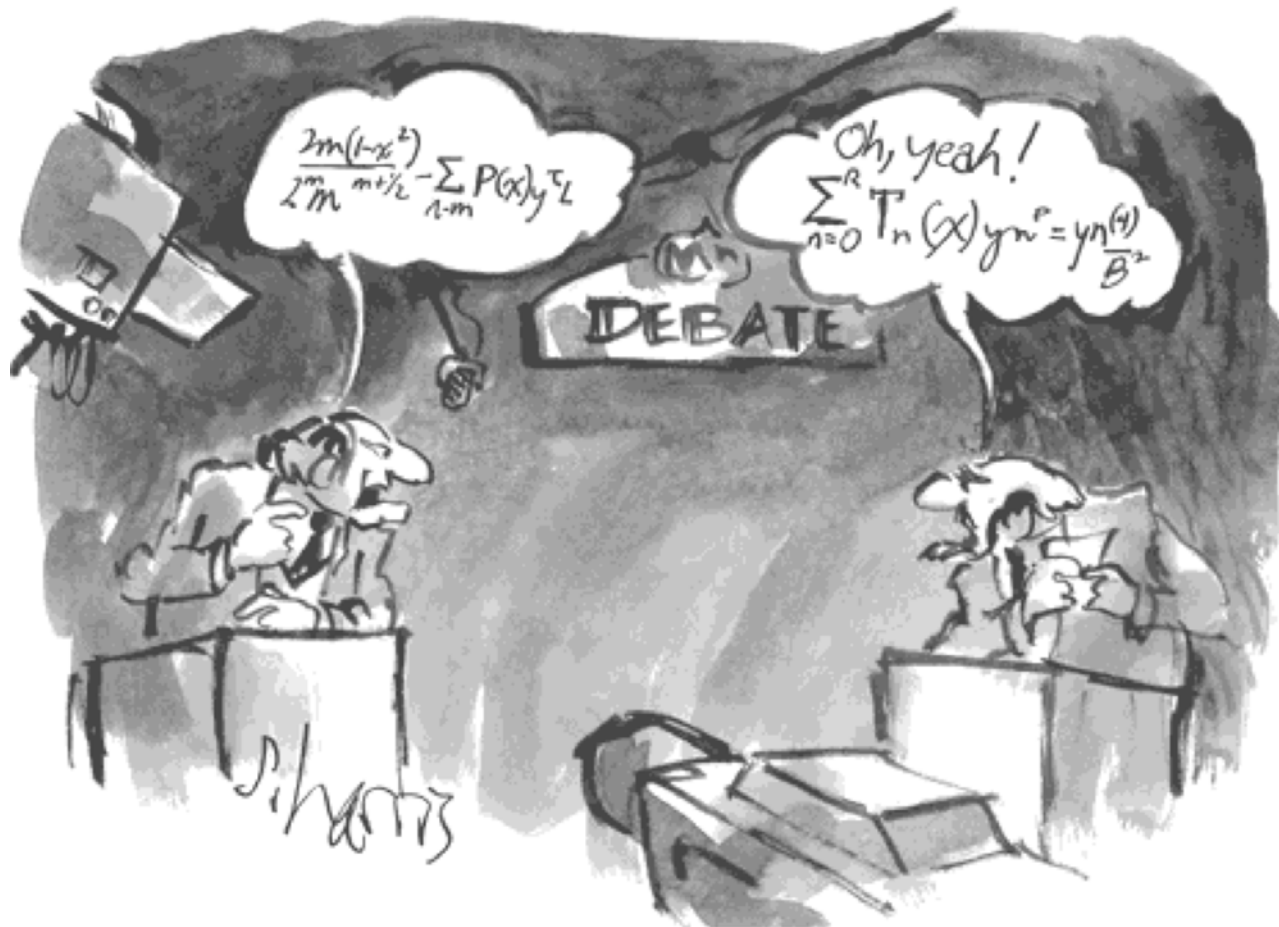


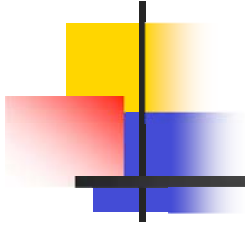
# Finding Your Narrative:

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A Different Kind of Reductionism

# My First Two Weeks at KITP





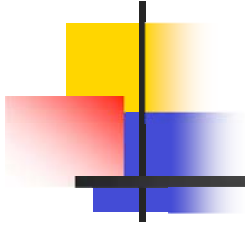
\* Communication isn't just about what you say and what's on your Powerpoint slides. It's how you say it.

\* Tone of voice, body language, eye contact (or lack thereof) and other intangibles all play important roles.

\* It's all about connecting with your audience. Without that, there can be no real communication.

But Physics Faces a Unique Challenge:





The public is very interested in science; but physicists need to meet them halfway -- and often, more than halfway.

- \*Lisa Randall on The Colbert Report
- \*MIT's Peter Fisher on Conan O'Brien
- \*Science-centric TV shows very popular:
  - C.S.I.
  - Bones
  - Numb3rs
  - The Big Bang Theory
  - Mythbusters



## What's Coming Up:

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Feb 22: "To Blog or Not to Blog? That is the Question"

Feb 29: "Press Conference Protocol"

Mar 7: "Inside the Writer's Room: Creating a Physics-Centric TV Series"

Mar 14: "The Art of the Book Deal"

Mar 21: "Just Don't Quote Me: The Perils and Pitfalls of Speaking to the Press"

Mar 28: "Interview with the Physicist"

Apr 4: "A Day at the Improv"

Apr 18: "PowerPoint Karaoke!"

Apr 25: "Mythbusters: Are There Really Two Cultures?"



There is method to my madness!

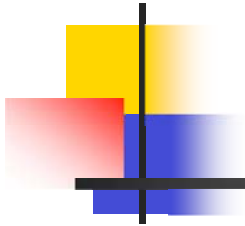
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- \* There are an increasingly diverse types of media formats and a general trend towards integrating them.
- \* This means we must be flexible and adaptable when communicating science. The message must fit the format.
- \* Fortunately, there is one common element to them all:

# THE NEED FOR A STRONG, COMPELLING CORE NARRATIVE







- \* Science has its stories, too. The trick to good science communication is finding the underlying core narrative of your research topic.
- \* Once you have that, you can add layers of details as needed to suit whatever format or target audience you wish.
- \* Those target audiences include technical communication among physicists. Even if you have no interest in regularly communicating with the media, the same skills apply to communicating with your fellow physicists.



How do we find that core narrative?

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STEP 1: Foster “Beginner’s Mind”

Remember what it was like not to know.

STEP 2: Practice Creative “Reductionism”

Boil everything down to just the most basic, critical elements.

This is NOT “dumbing down.” It’s finding your  $E=mc^2$ .



## CASE STUDY #1:

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Reheating of the universe in the inflationary model





# What are the core elements?

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## CONTEXT:

The birth and evolution of our universe.

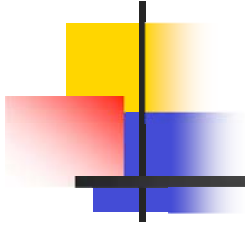
## PROTAGONIST:

The universe itself

## FAMILIAR STORY ARC(S):

Classic “origin story”

Coming-of-age archetype



## CENTRAL CONFLICT:

A mystery that must be solved

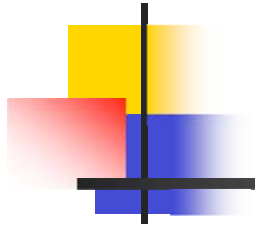
In this case: what is the mechanism that caused this key transitional phase and gave rise to the particles/radiation in the universe?

**damn anti-gravity cat**



**always disproving ma theorem**

128NHRS@GHEEZBURGER.COM



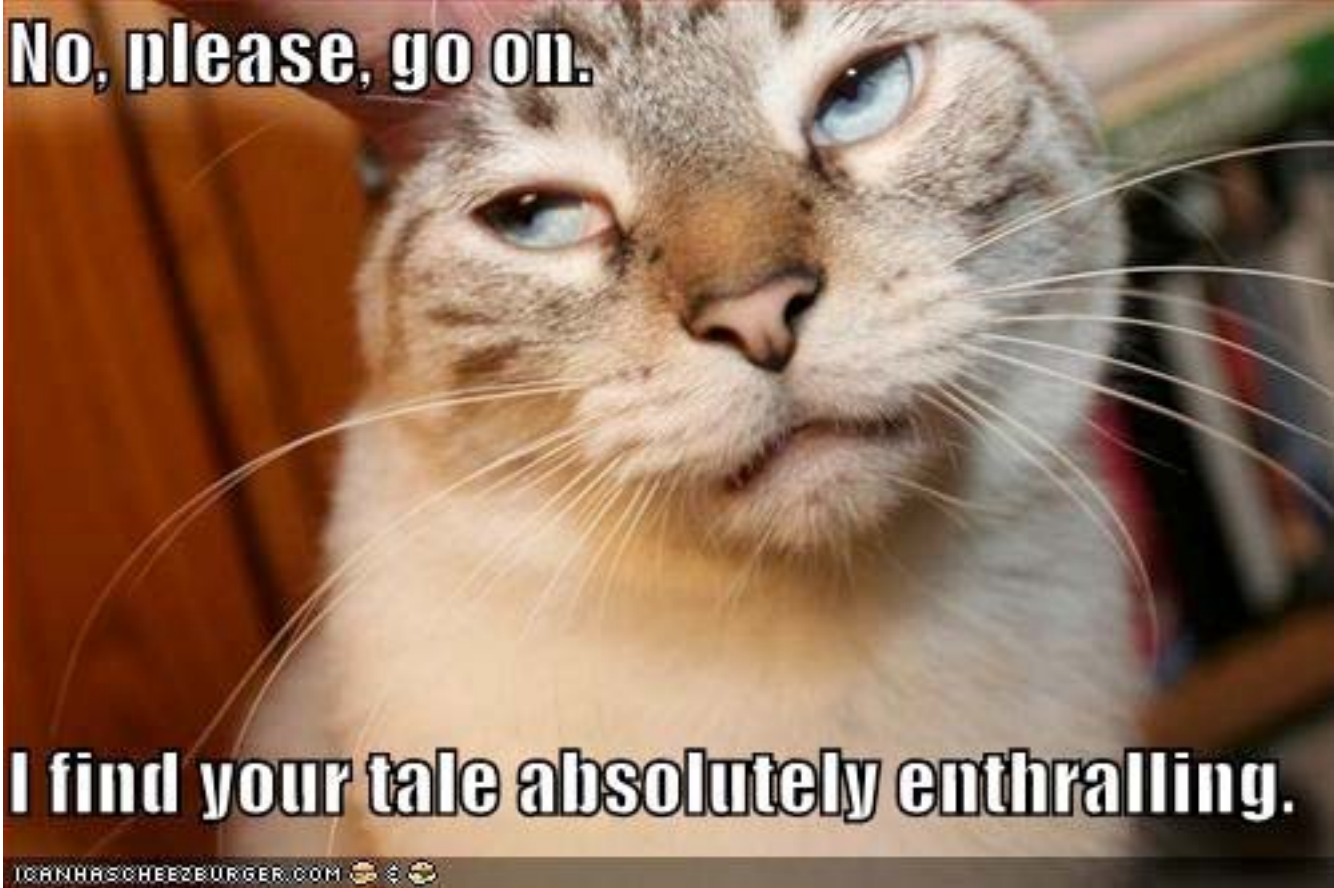
**WE HAVE A SUSPECT:**  
Parametric resonance

**WE HAVE CLUES:**  
Data/observations to date

**WE HAVE CONSTRAINTS:**  
The laws of physics



Voila! We have our core narrative!

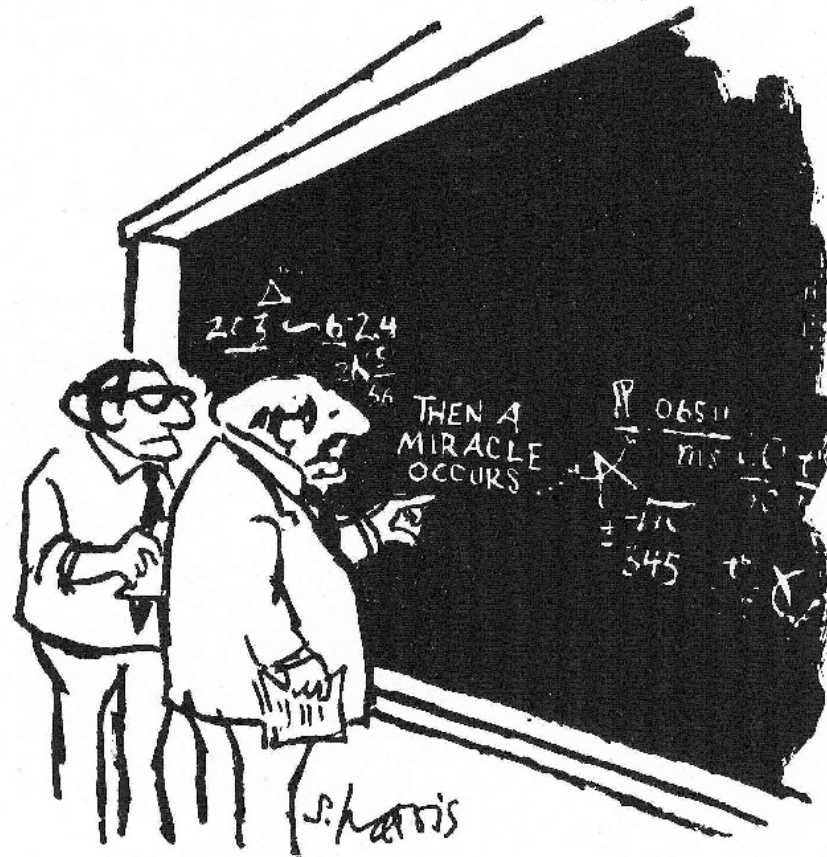


**No, please, go on.**

**I find your tale absolutely enthralling.**



Now we can start adding layers of complexity.



"I think you should be more explicit here in step two."

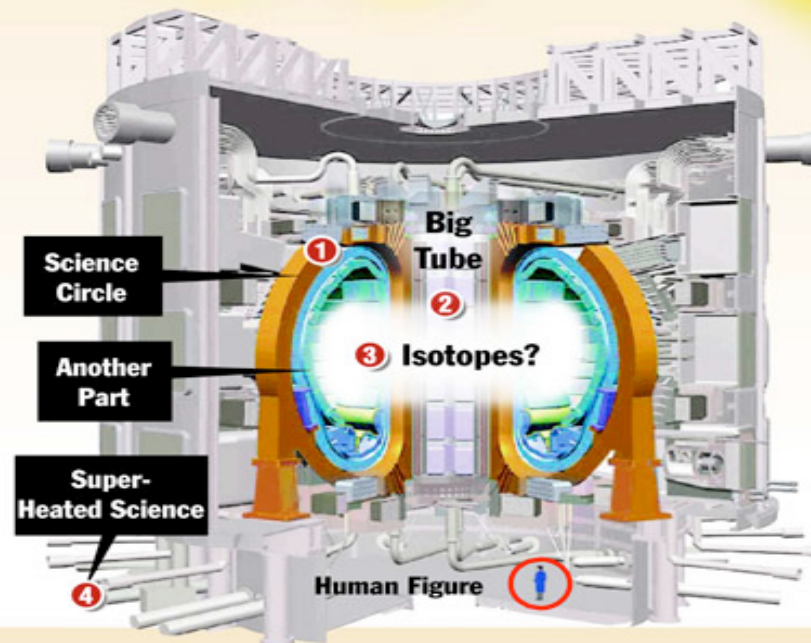
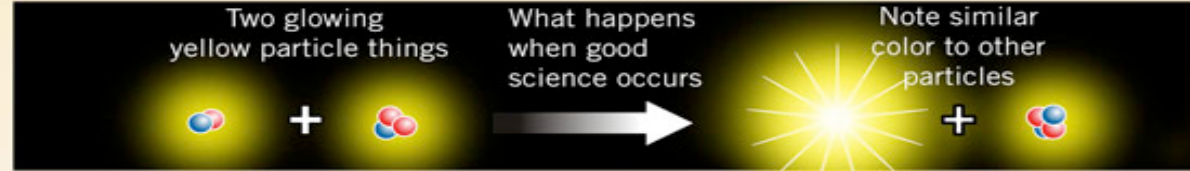


The devil is in the details....

Onion Science Thursday

# Giant Machine Creates Science

The Onion explains the inner workings of the complex, expensive science thing.



## A Science Machine

The expensive device will test and execute more science than ever before

- 1 Scientists make sure machine's On/Off button is switched to On
- 2 Parts of the machine begin to move, at first slowly, and then rapidly
- 3 A lot of science begins to generate
- 4 Many things light up and sounds of thunder happen
- 5 Science ends



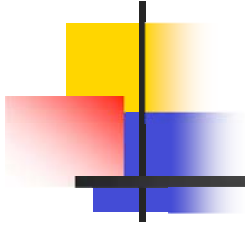
## A few sample satirical quotes:

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“According to the scientists, the electromagnetic science-maker will make atoms move and spin around very quickly.”

“The scientists, in Rep. Gordon’s words, appeared ‘very smart-sounding’ and confident that their big spinner would solve some kind of problem they described.”

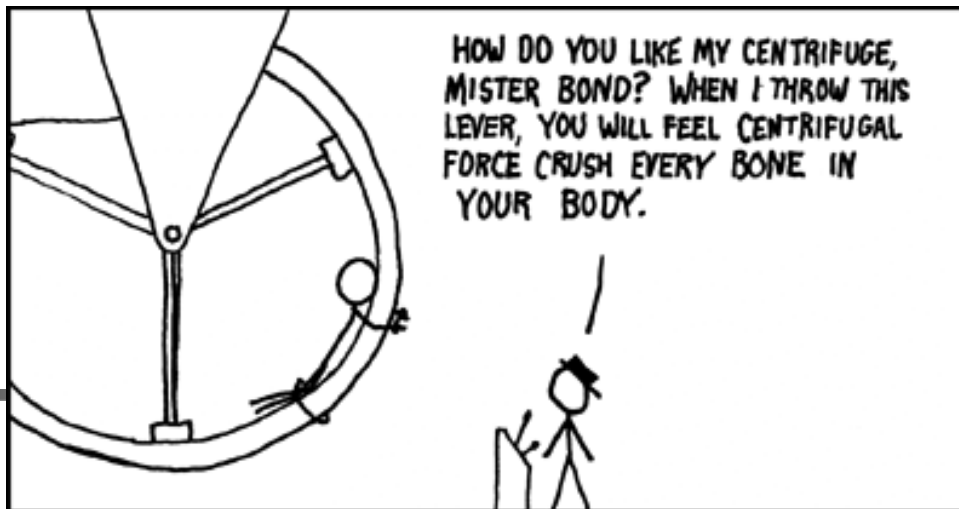
“Another diagram presented to lawmakers contained several important squiggly lines, numbers and letters. Despite not being numbers, the letters were reportedly meant to represent mathematics. The scientists seemed to believe that correct math would make the science thing go.”



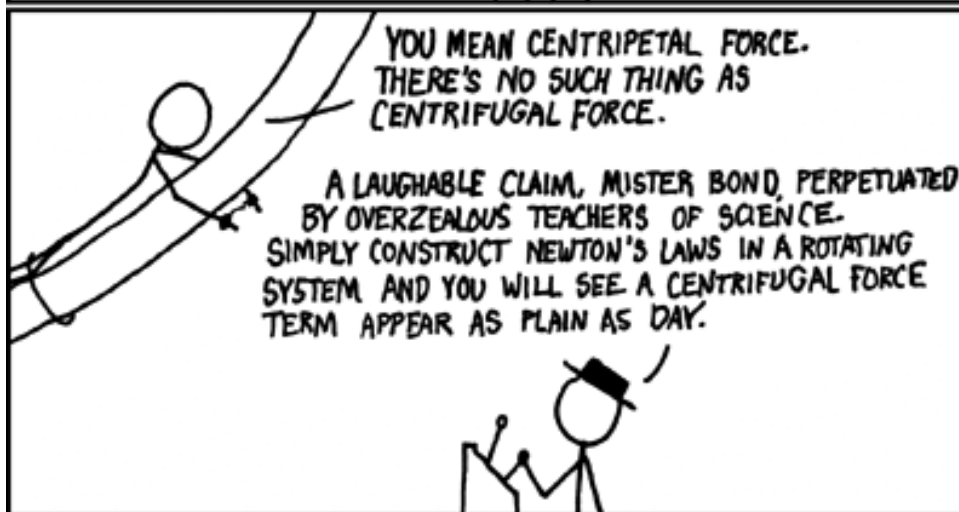
The *Onion* article didn't explain ENOUGH, but more often than not, scientists attempt to explain too much -- far more detail than is necessary.

There is only so much detail non-scientists can absorb. You can't close such a large a knowledge gap in a single story.

Scientists love to explore minor technical points. This is great from a science standpoint, but from a narrative standpoint, it interferes with the story. PACING IS EVERYTHING! Stay on track!



HOW DO YOU LIKE MY CENTRIFUGE, MISTER BOND? WHEN I THROW THIS LEVER, YOU WILL FEEL CENTRIFUGAL FORCE CRUSH EVERY BONE IN YOUR BODY.



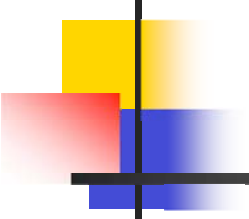
YOU MEAN CENTRIPETAL FORCE. THERE'S NO SUCH THING AS CENTRIFUGAL FORCE.

A LAUGHABLE CLAIM, MISTER BOND, PERPETUATED BY OVERZEALOUS TEACHERS OF SCIENCE. SIMPLY CONSTRUCT NEWTON'S LAWS IN A ROTATING SYSTEM AND YOU WILL SEE A CENTRIFUGAL FORCE TERM APPEAR AS PLAIN AS DAY.



COME NOW, DO YOU REALLY EXPECT ME TO DO COORDINATE SUBSTITUTION IN MY HEAD WHILE STRAPPED TO A CENTRIFUGE?

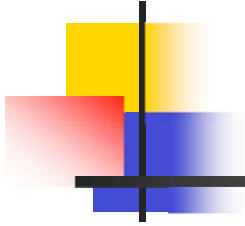
NO, MISTER BOND. I EXPECT YOU TO DIE.



## Handy Tips to Keep in Mind:

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1. Pay attention to how we misunderstand. This can give you insight into how to better tailor your message to the target audience. (There may be no hope for Colbert.)
2. Avoid unnecessary tangents and quibbling over minor details. It hijacks the narrative flow.
3. Eschew the obfuscation! That means **NO JARGON**. Every time you use a technical term, you **MUST** define it in plain English. Do this sparingly as it also hijacks the narrative flow.
4. Embrace analogy and metaphor. Tough to do this well, but the potential payoff is **HUGE**.



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## WHAT IS THE BACKSTORY?

Introduce us to our protagonist: The Universe. Give us what has happened to date/what is known thus far.

## WHAT IS THE MYSTERY?

Introduce us to what you're trying to find out, and why it's important that you "solve" the case.

## WHO IS THE SUSPECT?

Introduce us to parametric resonance.

## WHAT IS THE EVIDENCE?

Why might it be the "culprit"?



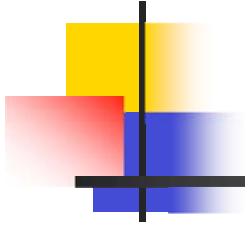
## **CASE STUDY #2:**

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### The Story of the LHC

A much tougher challenge! Basic story has been covered extensively in the media, in part because HEP has gotten very good at telling a compelling narrative.

But what are the untold stories? This is a good time for exploring those, and perhaps laying the groundwork so folks can better follow the LHC results when we start getting them.



## Some options:

- More than 1 Higgs? Beyond the Standard Model
- Electroweak symmetry breaking? What the heck is that? Why should we care?
- Other?? EG: “Why You Weigh So Much” to discuss chiral symmetry breaking





Once we've picked a topic for the story:

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What is the broader context for this topic?

Who is the protagonist?

What is the main story arc?

What is the central conflict?

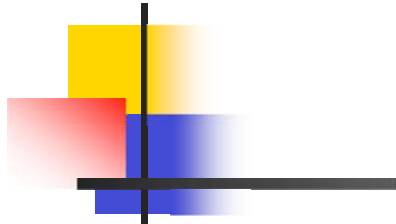
THEN:

Give us the protagonist's backstory.

Outline the facts of the "case" and why we need to solve it.

Introduce us to the prime "suspect".

Explain the evidence and why it implicates the suspect.



A NATION OF EINSTEINS