



# How to Talk Science with Just About Anyone

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Users Meeting

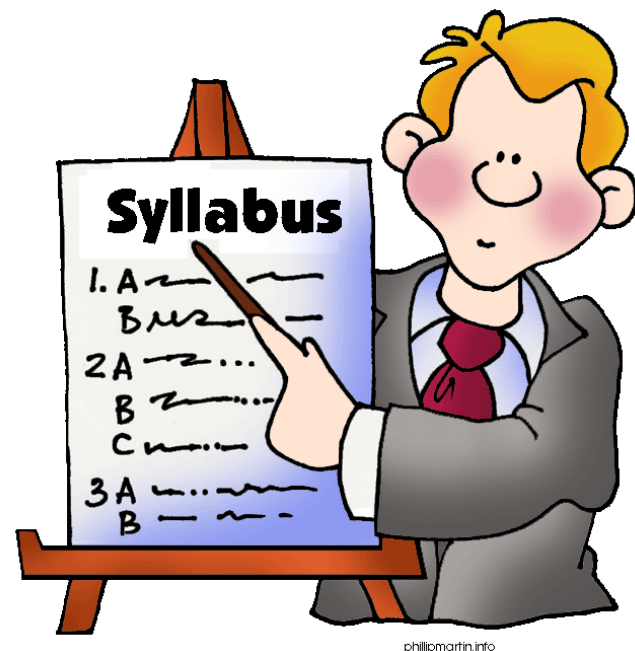
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# Hello!



# What we're going to cover

- The basics of connecting with a public audience.
- How to engage with people so their eyes don't glaze over.
- Distilling your message to the essentials.
- Creating a narrative out of your message.
- Facing your fear of being the story.
- Creating engaging presentations.
- Talking with the media.
- Spreading science on social media.
- Anything else you want!



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# Ground rules for interacting

- *Raise Hands* if you want to say something
- *Share the air.* If you have been dominating the discussion or participating disproportionately, let others participate. Alternatively, if you haven't said much, you are encouraged to participate more.
- *Be aware of power dynamics in the room.* A frequent occurrence in discussions is that members of historically overrepresented groups often dominate the discussion. We should ask ourselves the questions: Who is talking the most? Who is asking the most questions?
- Respect the *preferred pronouns* of others.

# What is successful science communication?

Who can you name who communicates science well?

What are the qualities of a good science communicator?

Who should be communicating science?

HINT: The answer to the last one is “all of us.”

# What does successful communication look like?

All communication is interaction.  
What do we want people to walk away with?

A better understanding of your work.

A positive feeling about you and your work.

An excitement to share what they have learned.





# Trying it out

The New York Yankees outlasted the Boston Red Sox 4-1 in a 16-inning marathon Saturday at Fenway Park, adding to a wild night in [MLB](#) that saw Los Angeles Dodgers rookie Cody Bellinger [hit for the cycle](#) against the Miami Marlins.

[Didi Gregorius](#) drove in the game-winning run when he singled to score Jacoby Ellsbury, who led off the inning with a double. Austin Romine added an RBI single to make it 3-1, and Gary Sanchez hit a sacrifice fly to the warning track that plated Gregorius to give the Yankees a three-run cushion.

The comeback wouldn't have been made possible without some heroics from Matt Holliday, who tied the score at one in the top of the ninth when he [smashed a solo home run](#) off closer Craig Kimbrel that sailed over the Green Monster.

Boston's lone run was scored in the third inning when first baseman Mitch Moreland hit a sacrifice fly to center that scored Mookie Betts.

# The physics equivalent

The results rival the precision of *Planck*'s and are largely consistent with both the  $\Lambda$ CDM model itself and the model's parameters as derived mostly from the CMB. Determinations of the density of matter in the universe and the sum of the neutrino masses, for example, yielded values that deviated slightly but are compatible with those from *Planck*. The survey data are also consistent with an unvarying cosmological constant. When combined with *Planck* measurements, the survey brings the value of the Hubble constant closer to the value deduced by observations of supernovae and Cepheid variable stars (see the article by Mario Livio and Adam Riess, *Physics Today*, October 2013, page 41).

The survey's error bars should shrink further once researchers crunch more data, first from three years of observing and then from five. Ultimately, the *Large Synoptic Survey Telescope*, currently under construction in Chile, will grab the baton when its camera captures 3.2-gigapixel images of more than 30 billion galaxies. (Dark Energy Survey collaboration, papers presented at the American Physical Society's division of particles and fields meeting, 3 August 2017.)



# The importance of narrative

Science is fundamentally about people – either the people who do it or the people who are affected by it. Science communication is fundamentally the story of those people.



# The importance of narrative

Story is how we learn, but more importantly, story is how we connect, and connection is the most crucial part of communication. Show me a graph or an equation, I probably won't remember. Tell me a story, I'm in.



# Connecting with an audience

Personal connections are the most important part of communication.

It's not what your audience knows as much as it is what they connect with.



# Who is your audience?

Remember that this is all about your audience. Connect with them! Ask these important questions:

- WHO is this for?
- WHAT are they interested in?
- WHAT do they already know?
- HOW can you get this specific audience to engage with you?



# Communication is interaction

This means listening is just as important as talking.  
Ask questions, learn about who you are speaking with.  
Engage with them, don't just talk to them.  
Watch for the eyes-glazing-over moment.





# You are a story

Your audiences are interested in connecting with you. Tell them your story. Personalizing your science takes nothing away from the work.



# Make it relevant

In order for audiences to connect with your work, you need to make it relevant to their lives. Connect it to what is important to them. Make it part of their story.

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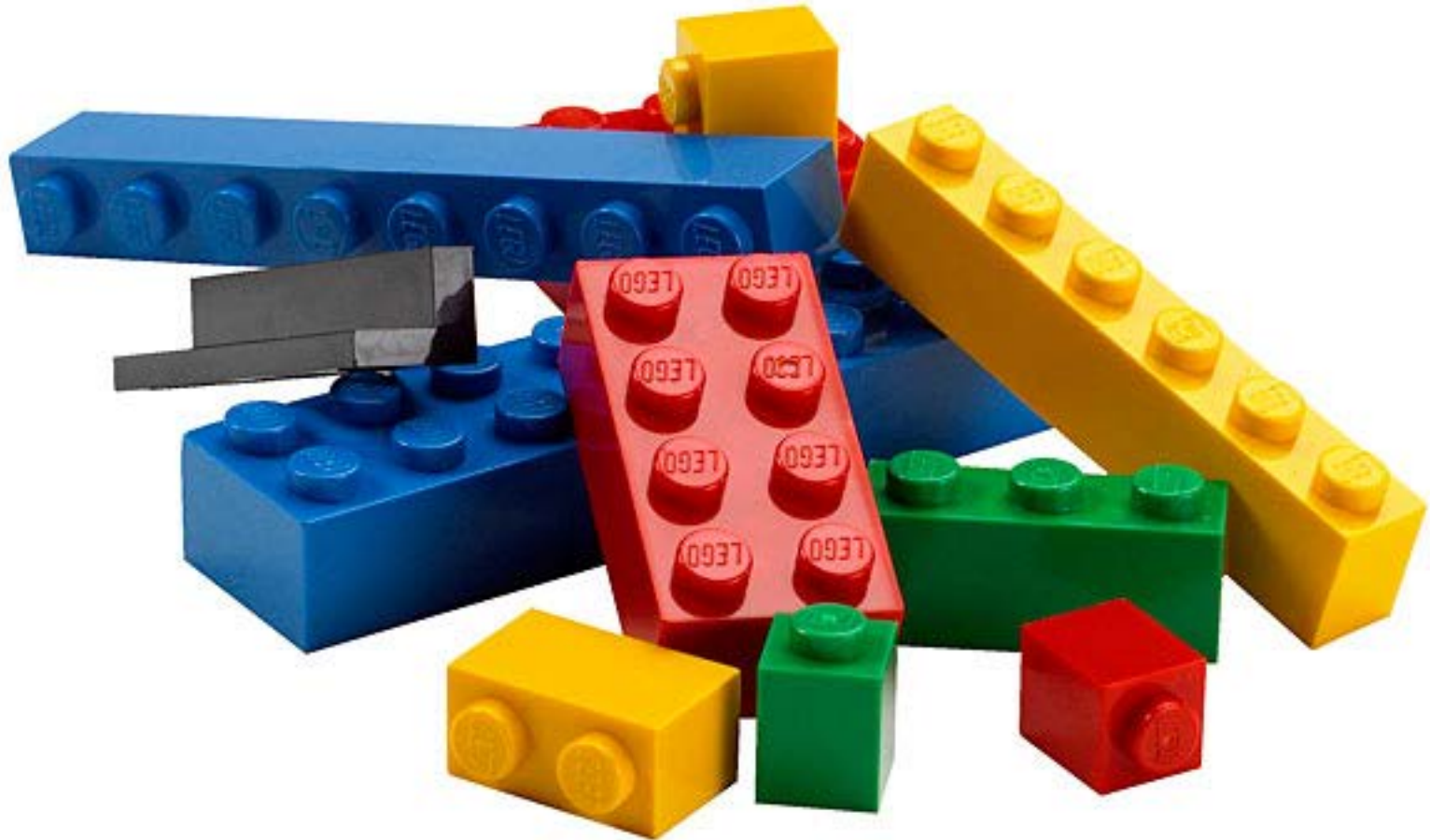
**WHAT DOES  
IT ALL  
MEAN?**

# Analogies yes, jargon no

Reframing concepts in interesting ways can help capture and keep an audience's attention. Analogies require some brainstorming, but are effective.



# Lego exercise



# Distilling your message

If you only have a few minutes with someone, what do you most want them to know and understand about your work?

It's a cliché, but elevator speeches work.





# Key messages

Think of the two or three most important messages you want to get across.

Examples:

1. Neutrinos are very hard to study, but important.
2. The experiment I am working on is amazing because \_\_\_\_\_
3. It takes a team of hundreds from around the world to make an experiment like this work.

Then stick to those messages! When you feel yourself drifting away from them, return to them.

# Let's try it out!

Using these example messages (or your own), create your own elevator speech.

1. Neutrinos are very hard to study, but important.
2. The experiment I am working on is amazing because \_\_\_\_\_
3. It takes a team of hundreds from around the world to make an experiment like this work.

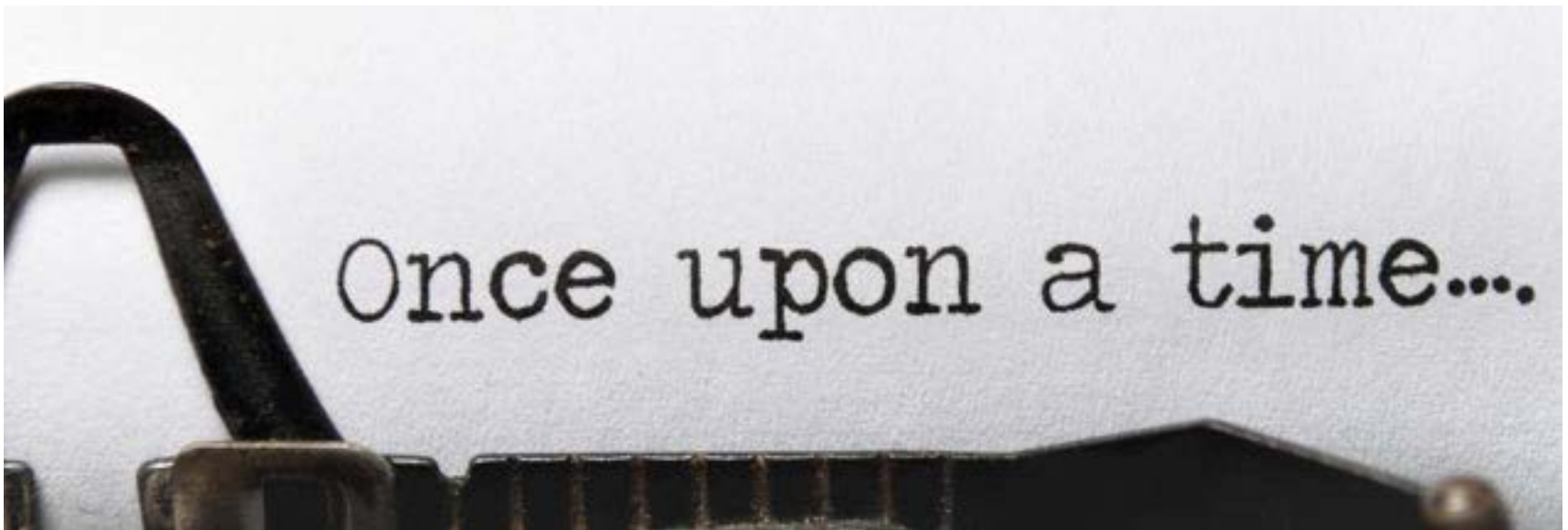


# Sample speech

Hello, I'm \_\_\_\_ and I study the mysteries of the universe. One of the biggest mysteries is a particle called a neutrino. Trillions of them go through you and everything else every minute, which makes them hard to study, but we know they had an important role in the formation of the universe. My experiment will use a huge machine in an old gold mine to give us insight into how these particles behave. More than a thousand of us around the world work on this, and we're all excited about it because it might tell us why we exist at all.

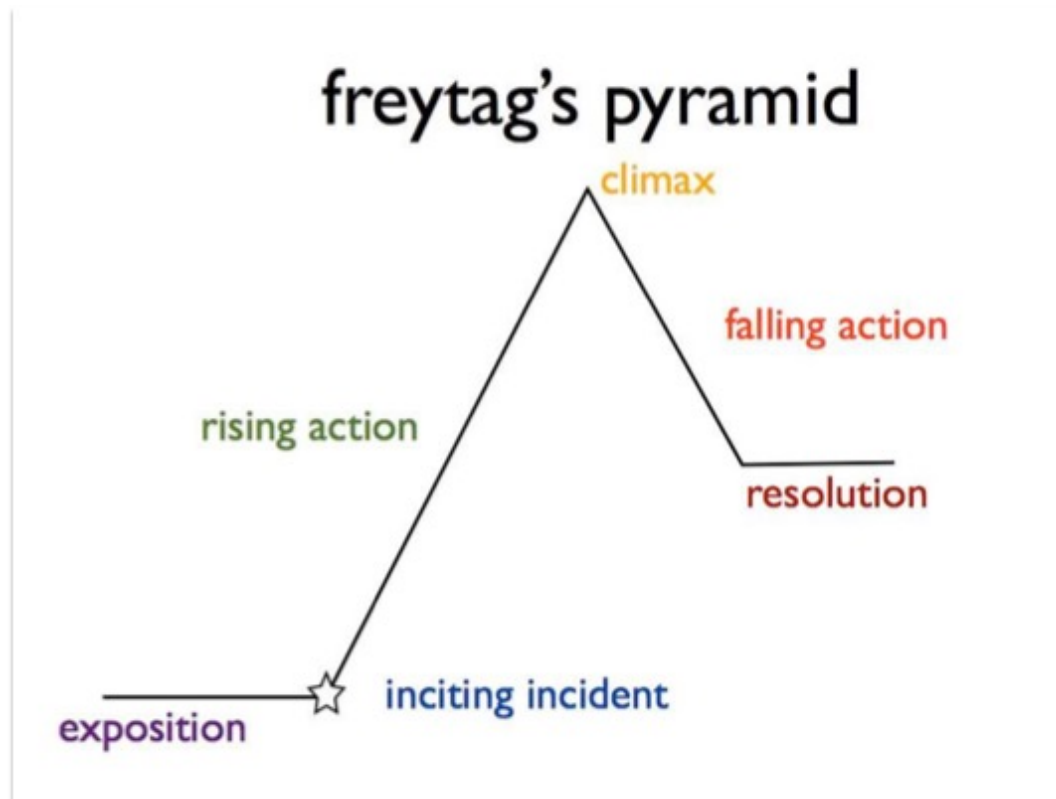
# Your elevator pitch is not a story

It is the starting point of a narrative. It's the crux of the information you want to convey. Telling a story is the best way to convey it so that people will respond.



# Types of narrative

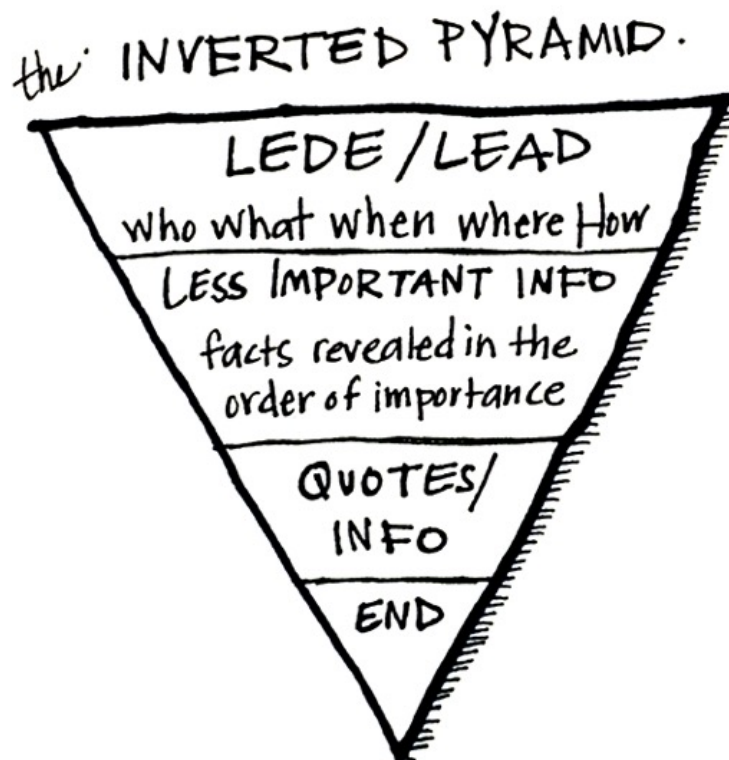
We're all familiar with narrative structure from the films and television shows we watch and the books we read.





# Types of narrative

Journalism has its own self-imposed structure. The best stories – the ones you remember – ignore this completely.



# How to build a story

Stories have a beginning, a series of events in the middle, and an ending. (That ending can be “we don’t know yet!”)

Start with the question you are aiming to answer. What does your audience want to know? What will grab them? Then work backwards. If we have the answer, how did we find it? Were there any interesting people involved? Were you one of them?

Tell a story like you are talking to your neighbor at a backyard barbecue.



# How to build a story

One way to build a story is to keep asking questions. How did we get here? What happened? What happened next? Draw a through-line from the questions to the answers (or the answers to the questions) until you have a compelling tale.

Keep the language clear. Use analogies, relate your story to everyday things. Avoid jargon. Ask someone who isn't in this field to listen and tell you if you say something they don't understand.



# Above all

Be excited! If you are not inspired by your story, no one else will be. Craft your story in a way that would make you want to listen to it. Then tell it in a way that will make others want to listen.



## When it's not working

You're trying to get your audience to follow, but they're not getting it. Here are some questions to ask yourself:

- Have you provided enough background information to keep them from getting lost?
- Are you using words they don't understand?
- Are you moving too quickly?
- Are you assuming they know or understand something that they may not?

It's OK to ask if they're not getting it, and find out why!



# Keeping that connection

Remember, it's all about interaction and engagement.



# Creating good presentations

Here's what to avoid:

- Slides with too much text
- Jargon
- Charts and graphs
- Equations
- Reading slides out loud with a laser pointer

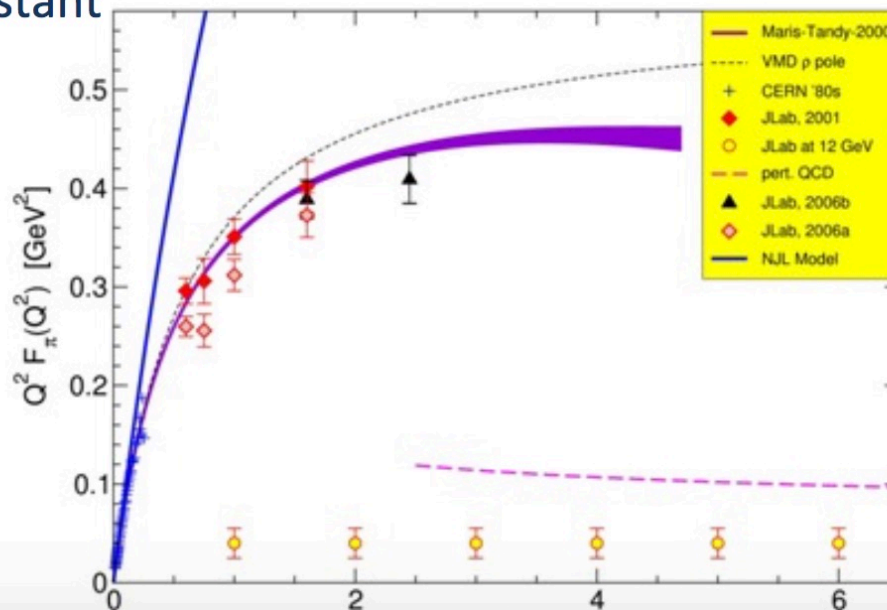


# Don't do this

## Electromagnetic Form Factor

- QCD-based DSE prediction:  $D(x-y) = \frac{1}{(x-y)^2}$   
produces  $M(p^2) \sim 1/p^2$
- cf. contact-interaction:  $D(x-y) \sim \delta^4(x-y)$   
produces  $M(p^2) = \text{constant}$

- ❖ Single mass parameter in both studies
- ❖ Same predictions for  $Q^2=0$  observables



# Ask questions and take questions



# Talking with the media





# Why is media important?

Amplification!





# Things to understand about the media

They exist to tell stories that people will read/watch.



# Things to understand about the media

We cannot control what they print or broadcast.



## EXPRESS

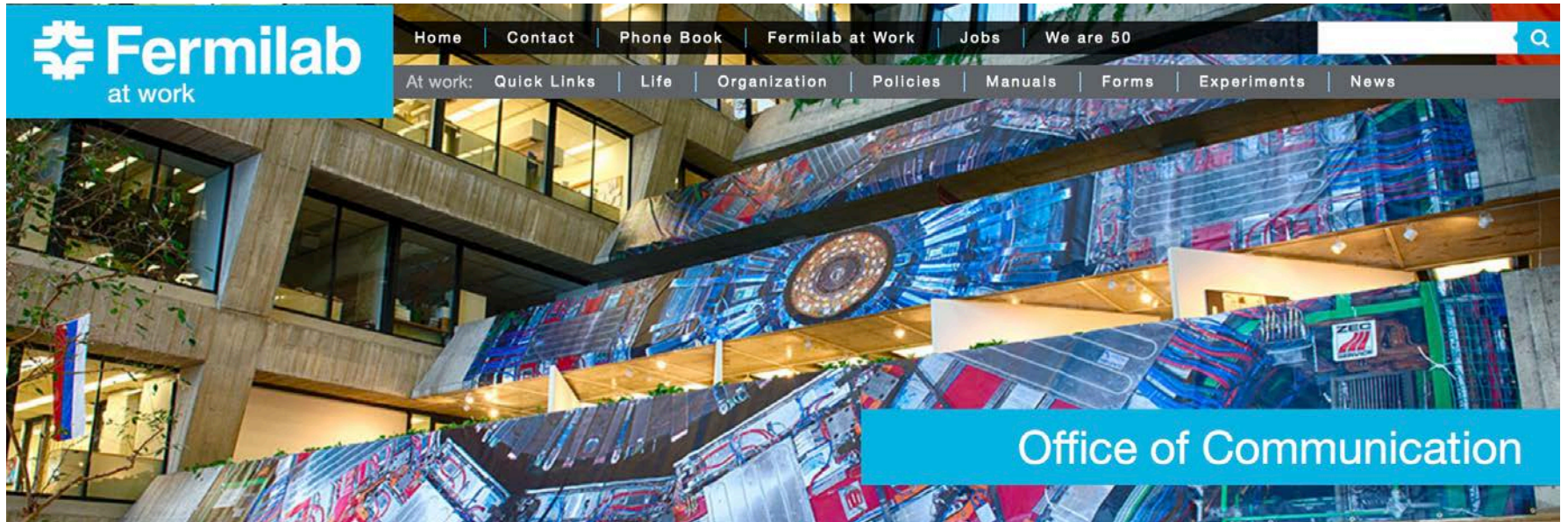
Home of  
the Daily and  
Sunday Express

### Terrifying 'dark universe' discovered within our universe and it spells DOOM for humanity

A MYSTERIOUS 'dark universe' which exists alongside our own visible universe has been mapped by scientists. And the findings spell ultimate doom for humankind.

# Your communications office

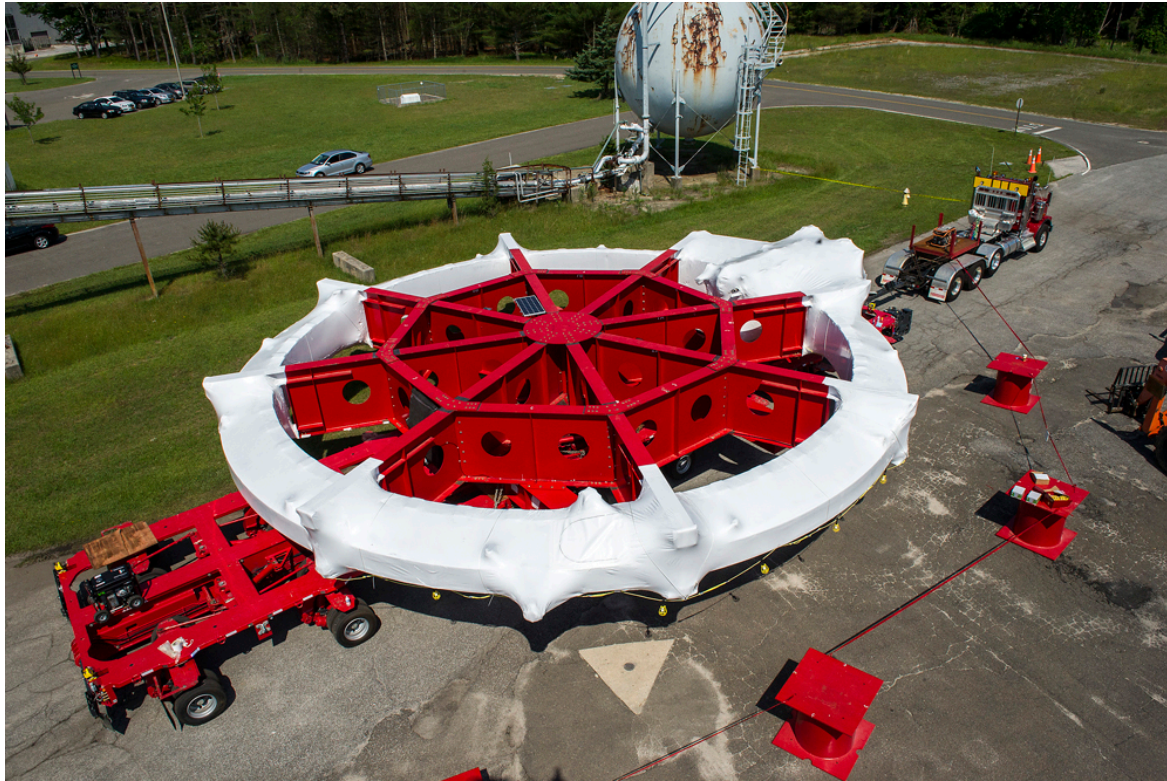
Your institution has one, and they are here to help!





# The media loves stories

They're interested in scientific results, but they're more interested in the stories that surround them.



# You are a story

Reporters are looking to personalize any story, especially complex ones. Your story is a way in for them and for their readers/viewers. Don't be afraid to share your story!



# Media interviews

- Relax and be yourself.
- Help them to get it right.
- Stick to what you know.
- Don't bluff or make things up.
- You don't have to answer anything that makes you uncomfortable.
- Stay away from politics, religion, etc.
- Remember your key messages and tell your story





# On-camera interviews

- Deep breaths! Relax!
- Watch your body language.
- Smile and be engaging.
- Don't let them steer the narrative
- Remember your key messages and tell your story



# Communicating on social media



Should scientists use social media? Hint: Yes.

# Social media

## Benefits:

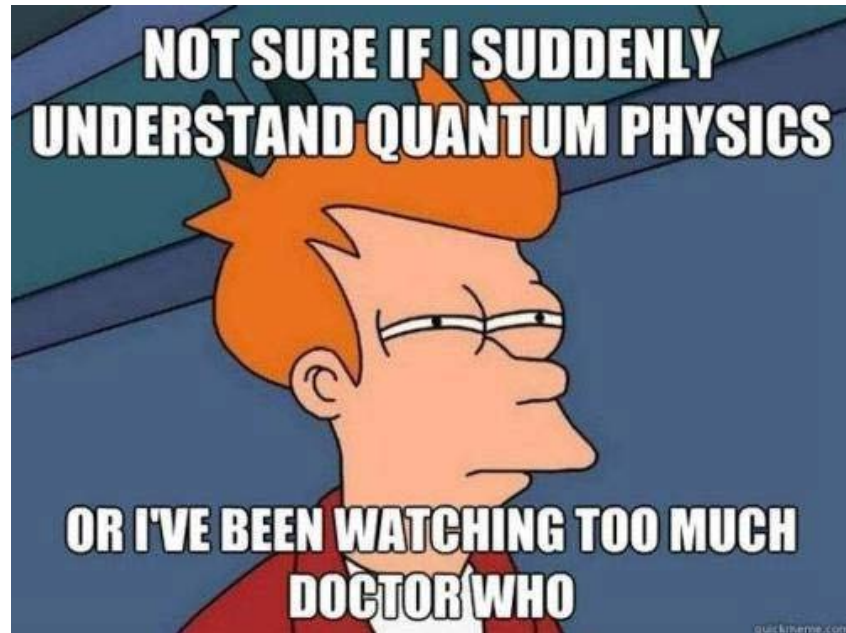
- Meet people where they are
- Reach diverse audiences
- Relaxed atmosphere



# Social media

## Techniques

- Be informal but respectful
- Include imagery whenever relevant/possible
- Look for ways to tie your science in to pop culture, news items, hashtags, etc.



# Social media

## Techniques:

- Interact with others and answer questions
- Show a slice of your life as a scientist (ups, downs, what you actually do) in addition to explaining the science



# Summary

- Communicating science is vitally important and we all should do it, and get better at it.
- Science is about people.
- Forging connections with your audience is step one. Know who they are and what they want to know.
- Tell stories. Don't forget that you are a story.
- Keep your key messages in mind.
- Use analogies. Stay away from jargon.
- Work with the media to tell your story. Help them to get it right, and don't answer anything you don't know or don't want to answer.
- Use social media to spread the word.



# Always leave time at the end!

