

# Ethics in Science, Science Communication, and Wind Power Generation

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# What I'll Do:

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- Brief Philosophical Introduction to Ethics
- Ethical issues in wind generation?
- Ethical issues in science and technology communications

# Ethics and Technology

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- Technologies *reflect* the values of those who develop them.
- Many technologies *change the evaluative perspective* of those who *use* them.



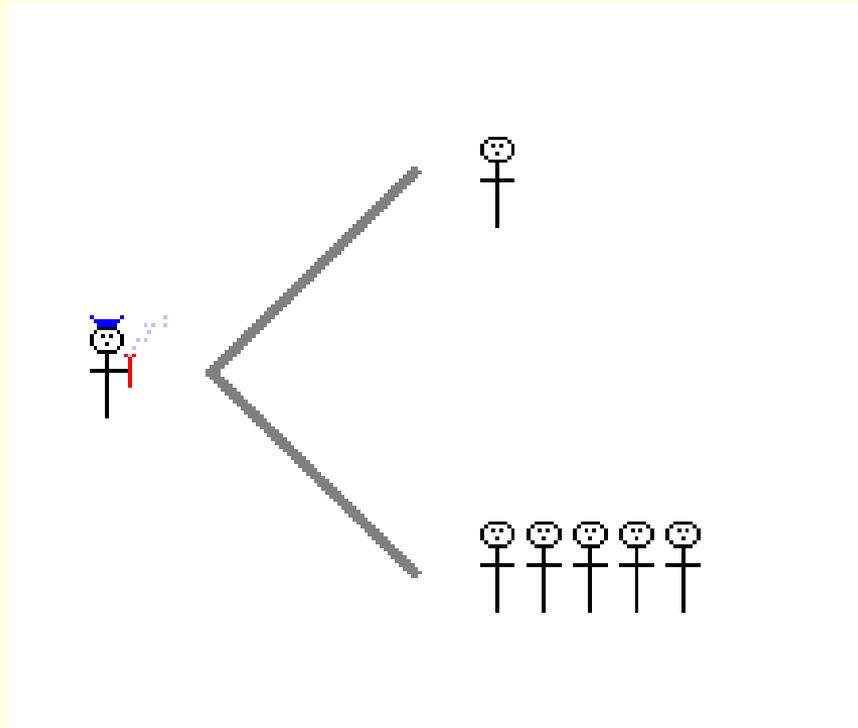
# A Very Brief Philosophical Introduction to Ethics

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- Whenever you make choices, you reveal your underlying values.
- We can *discover* our values by digging out the reasons that lie behind our choices (and those of other people).
- (There is always a risk of self-deception when we try to do this!)

# Bloggs Case #1

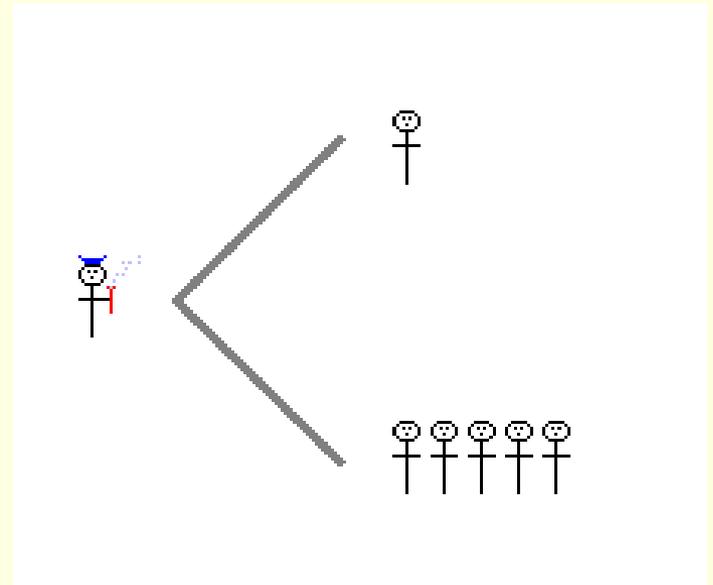
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# Bloggs Case #1

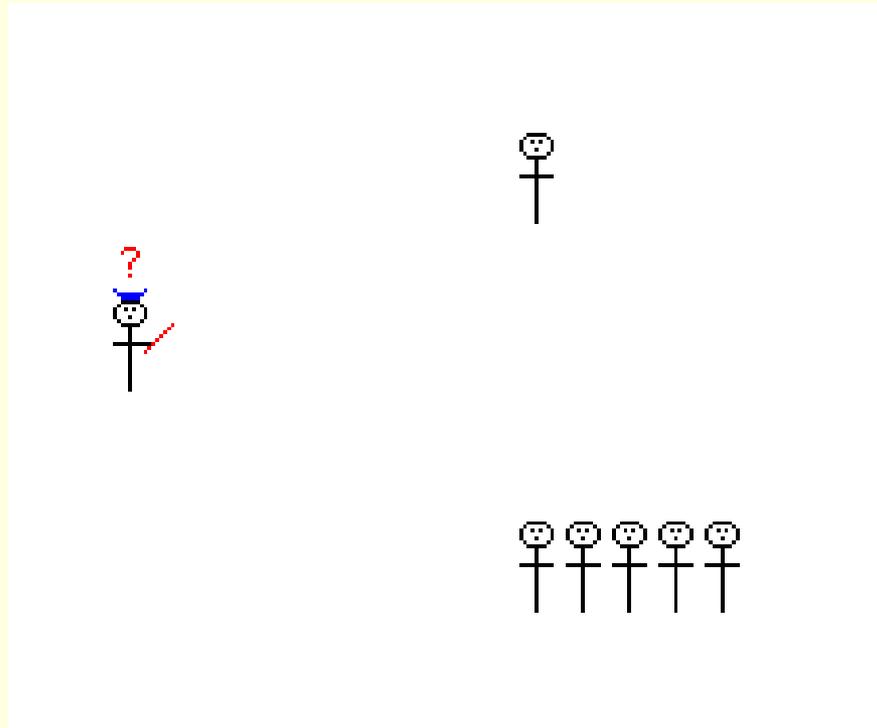
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- *“Utilitarianism”*: We have an obligation to do what will produce the greatest good for the greatest number. (GHGN Principle)



# Bloggs Case #2

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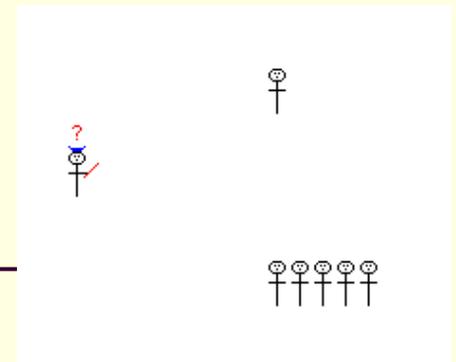
# Rights:

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- Would slicing and dicing Bloggs violate his rights? (What are rights?)
- Right: A justified claim that an individual (or group) may make to certain objects or certain treatment by others, associated with an obligation to someone that cannot be overridden merely to produce the greatest good for the greatest number.

# Bloggs Case #2

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- *Bloggs's right to X may take the form of:*
  - *A claim that Bloggs may make to a particular object (e.g., his kidneys)*
  - *A constraint on how Bloggs should be treated (e.g., he shouldn't be killed for his organs)*
  - *An obligation on others not to interfere with Bloggs's doing X (e.g., his continuing to live)*

# Ethical Theory

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- Kant: Categorical Imperative:
  - “Act only such that you could will the maxim on which you act as a universal law.”
  - “Act so that you treat humanity, whether in your own person or that of another, always as an end in itself, and never as a means only.”
- Would ‘slicing and dicing’ Bloggs for his organs involve treating him as a *mere means*?

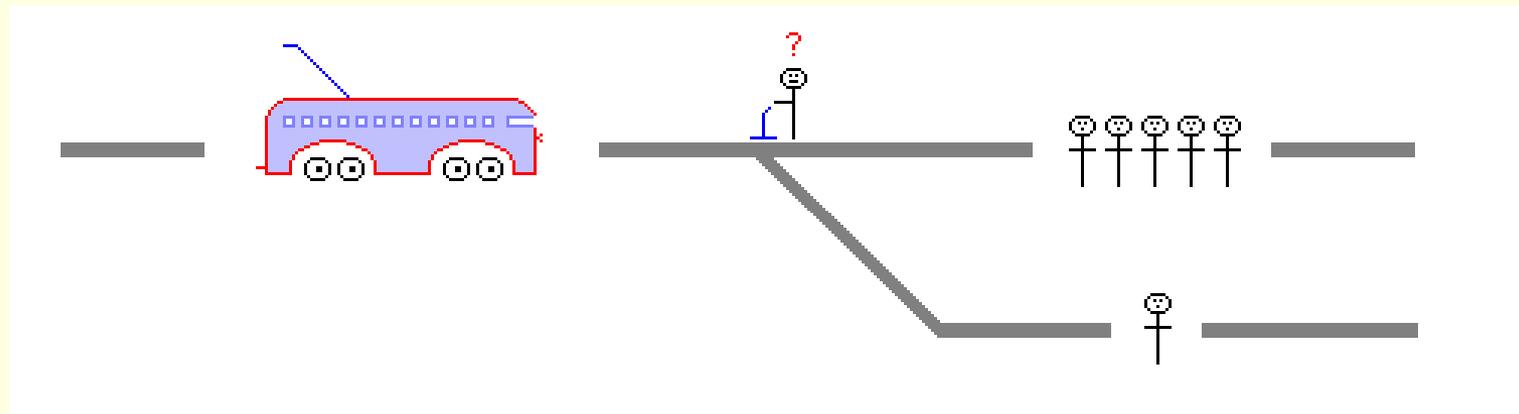
# Ethical Theory:

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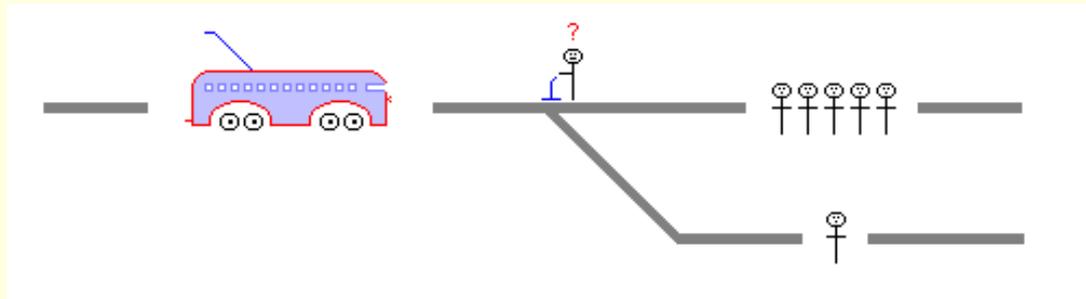
- Killing v. Letting Die: It has sometimes been argued that we have a moral duty not to kill, but no moral duty (or a lighter moral duty) not to let people die.
- Does this distinction explain why we shouldn't kill Bloggs for his organs?

# Bloggs Case #3

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# Bloggs Case #3



- *The ethics of acts vs. omissions*
- *The greater good vs. “clean hands”*

# Ethical Theory:

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- We *reveal* our ethical views when we explain or justify our choices and behavior to others.
- Ethical views can be thoughtless and unreflective, or thoughtful and reflective. To the extent that we're thoughtless and unreflective, our value system will lack *integrity* and *depth*.
- If our values are shallow and incoherent, we will make bad decisions, ...and we will be shallow and incoherent. (?)

# Ethics and Technology

- Where people disagree about policy or about technology, there are always values and ethical issues at play.



Logo: North American Platform Against Wind Power

# Ethics and Technology

- Know your critics.
- Respect your critics.
- Take critical arguments seriously and evaluate them with intellectual integrity.

## DRIESSEN: Wind-energy tax credits fund bird murder

Eagles being sliced back toward extinction

COMMENTS (56) SIZE: + / - PRINT



By Paul Driessen

Monday, August 6, 2012



Enlarge Photo

Illustration Windmills Killing Eagles by Greg Groesch for The Washington Times [more >](#)

Clean-energy devotees are proposing that the \$22-per-megawatt wind energy production tax credit be extended as part of "all of the above" energy policies. The slogan falls flat, even when it's expanded to "all of the above and below ground."

Instead, America needs an "all of the sensible" energy policies. If an energy option makes sense -- technically, economically and environmentally -- it should be implemented. If it flunks, it should be scrapped.

Industrial wind energy fails every test. It requires perpetual subsidies to survive. By taking tax revenues from productive sectors of the economy to provide expensive, unreliable electricity, it kills two to four jobs for every "green" job it creates.

Big Wind requires vast land and raw materials for turbines, backup power and transmission lines. China's rare earth metals industry devastates agricultural and wildlife habitat areas and harms human health.

# Ethics and Technology: of Birds and Wind Turbines?

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## ■ Response 1:

- Discredit critics
- Work to change attitudes through rhetoric and deception.
- Fight fire with fire.

## ■ Response 2:

- Investigate the basis and validity of critical claims.
- Marshal relevant evidence and reasons.
- Work to persuade those who disagree.

# Ethics and Technology

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- Outcome: Mutual Respect, Agreement, and Harmony.

(Just like our federal legislatures.)

(In yer dreams!)

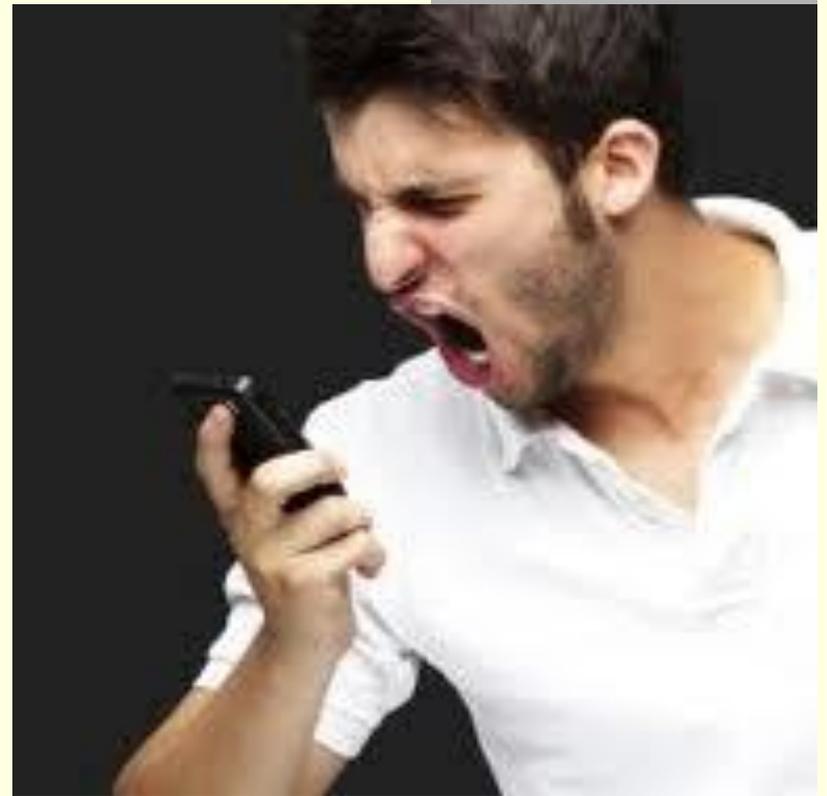


# Ethics and Technology

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- Outcome: Continued adamant and unyielding opposition even in the face of good reasons.

(We can't always persuade those who disagree.)



# Ethics and Technology

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“When two opposite points of view are expressed with equal intensity, the truth does not necessarily lie exactly halfway between them. It is possible for one side to be simply wrong.” -Richard Dawkins



# Ethics in Science Communication?

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NSF Grant:

- ETHICS IN SCIENCE COMMUNICATIONS
- Principle Investigators:
  - Michael Dahlstrom, Journalism & Communications
  - Jean Goodwin, Rhetoric & Speech Communications
  - Mari Kemmis, Administrative Services
  - Clark Wolf, Philosophy/Political Science

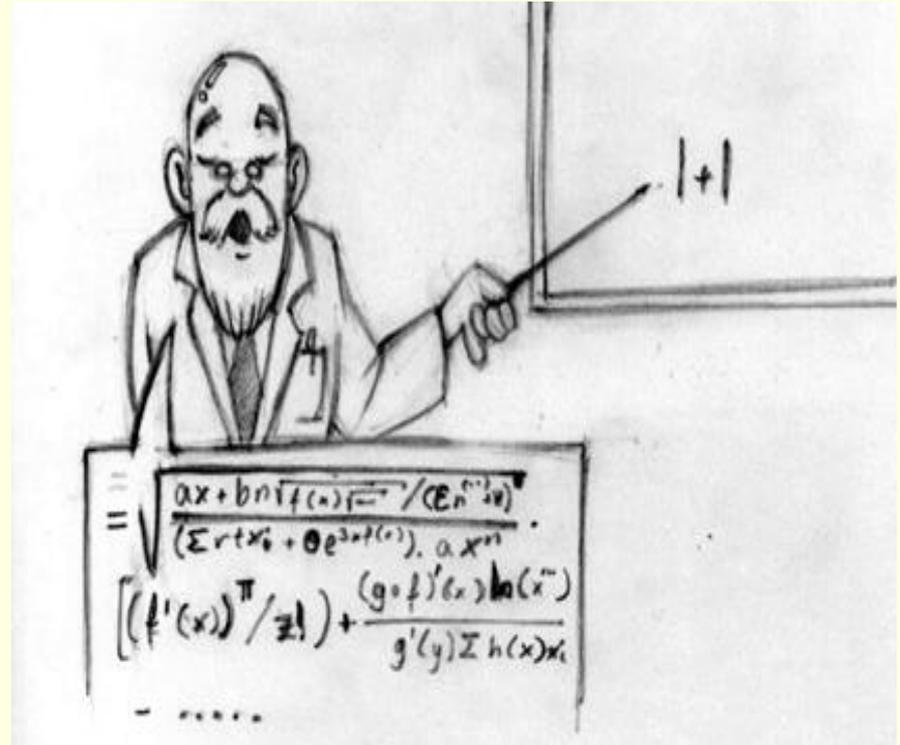
# The questions:

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- Should scientists communicate with “the public” and with media sources about their research, about recent advances, or about science controversies in the news?
- What *ethical norms* should govern communication in these contexts?

# When does Science Communication Go Bad?

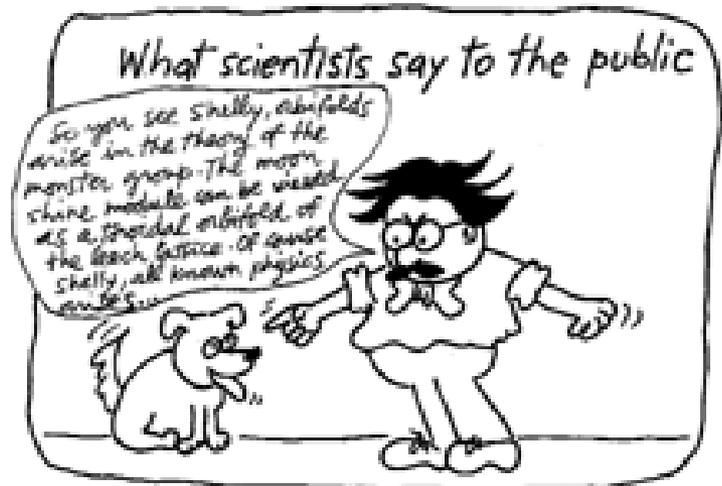
- Most work on Science Communication focuses on *effective* communication, not on the ethics of science communication.



# When does Science Communication Go Bad?

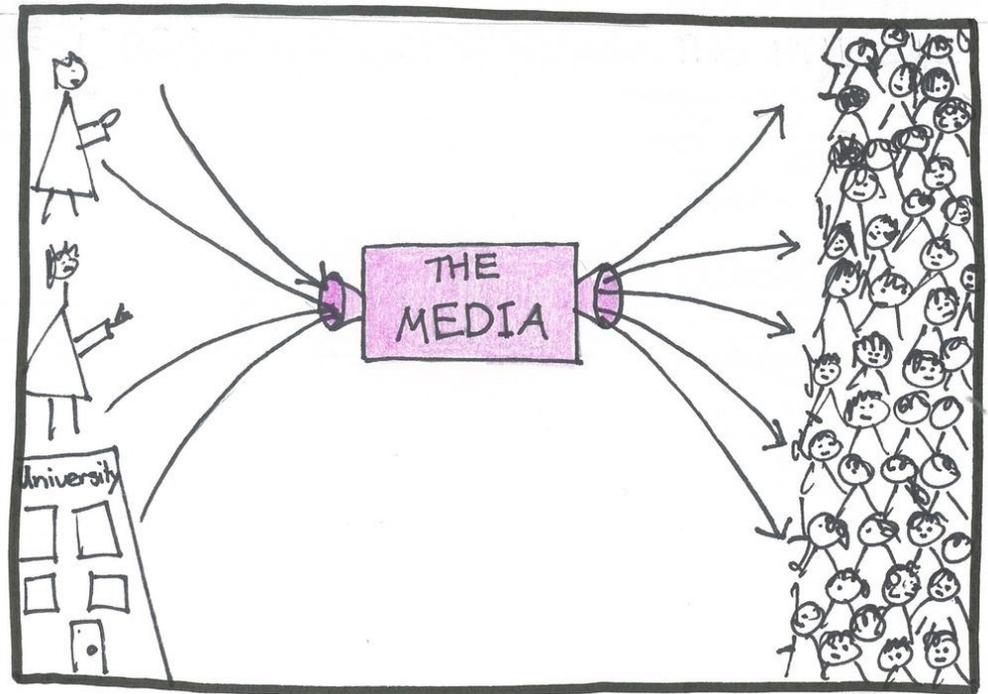
“It is simplicity that makes the uneducated more effective than the educated when addressing popular audiences.”

-Aristotle



# Science Communication:

- Should you talk with that reporter, or hide in your lab and wait until she goes away?



# Proposed Answers:

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- Scientists have a presumptive responsibility to communicate with the public when funding sources are public.
- Because they hold important and relevant information, Scientists have a presumptive responsibility to inform public discussion of science controversies, including a responsibility to speak with media sources when requested to do so.

# Proposed Answers:

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- Scientists have a **presumptive** responsibility to communicate with the public when funding sources are public.
- Because they hold important and relevant information, Scientists have a **presumptive** responsibility to inform public discussion of science controversies, including a responsibility to speak with media sources when requested to do so.

# On presumptive obligations:

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- To say that someone has a *presumptive moral obligation to do X* simply means that there is a good moral reason for this person to do X.
- These reasons may be ‘trumped’ or ‘overridden’ by competing reasons, and people frequently have *competing* obligations.
- Scientists who don’t spend their time communicating with the public are not *immoral* for their lack of engagement.

# Evaluating Wind Energy Generation and in Energy Policy

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Will the growth of wind energy

- ...reduce our pollution and carbon footprint?
- ...have a significant impact on wildlife, including rare or threatened species?
- ...help us kick the fossil fuel habit?
- ...help to achieve “energy independence?”
- ...degrade our landscapes with “unsightly” turbines?
- ...?

# Ethical issues often address underlying ethical questions:

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- Q: Why decrease our carbon footprint?
- A: Reduce rate of global environmental change?
- R1: “You believe that climate crap?”
  - A: Technical? Evaluative?
- R2: “Why should we care about climate change?”
  - A: Obligation to future generations?
  - A: Obligation to preserve the environment?

# Ethical issues involve technical elements and assumptions:

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- “Will the growth of wind energy help us to reduce our pollution and carbon footprint?”
- Full cost accounting: Need to consider *all* the carbon-costs associated with wind power, and balance them against the carbon-reduction.
- Such cost/benefit accounting reflects a *consequentialist* value frame.

# Ethics of Science Communication

## In the News:

Full text access provided to **Iowa State University**  
by **Library Acquisitions**

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International weekly journal of science



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## News

*Nature* **419**, 769 (24 October 2002) | doi:10.1038/419769a

### Medical funding group calls for clamp-down on hype

David Adam

Researchers who talk to the press prematurely about unpublished research could soon face harsher sanctions than the odd disapproving glance from a colleague. Under research misconduct guidelines just released by an association of British medical charities, they could be blacklisted for funding, the head of the association says.

Diana Garnham, chief executive of the London-based Association of Medical Research Charities (AMRC), which issued the guidelines on 17 October, says its members are fed up dealing with the fallout from over-hyped or misleading results. "Scientists don't do their work in a vacuum," she says. "There is an audience for whom their work is directly relevant, and they need to bear that in mind."



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# The L'Aquila Verdict: A Judgment Not against Science, but against a Failure of Science Communication

By David Ropeik | October 22, 2012 | 13

Scientific American  
22 October 2012

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A court in Italy has convicted six scientists and one civil defense official of manslaughter in connection with their predictions about an earthquake in l'Aquila in 2009 that killed 309 people. But, contrary to the majority of the news coverage this decision is getting and the gnashing of teeth in the scientific community, the trial was not about science, not about seismology, not about the ability or inability of scientists to predict earthquakes. These convictions were about poor risk communication, and more broadly, about the

responsibility scientists have as citizens to share their expertise in order to help people make informed and healthy choices.

# Ethically Problematic Modes of Communication:

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- Advocacy Science
- Framing Research Results
- Hype
- Spin

# Ethically Problematic Modes of Communication:

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- Advocacy Science: Two Senses:

(1) Using scientific results to influence political process or social outcomes, or

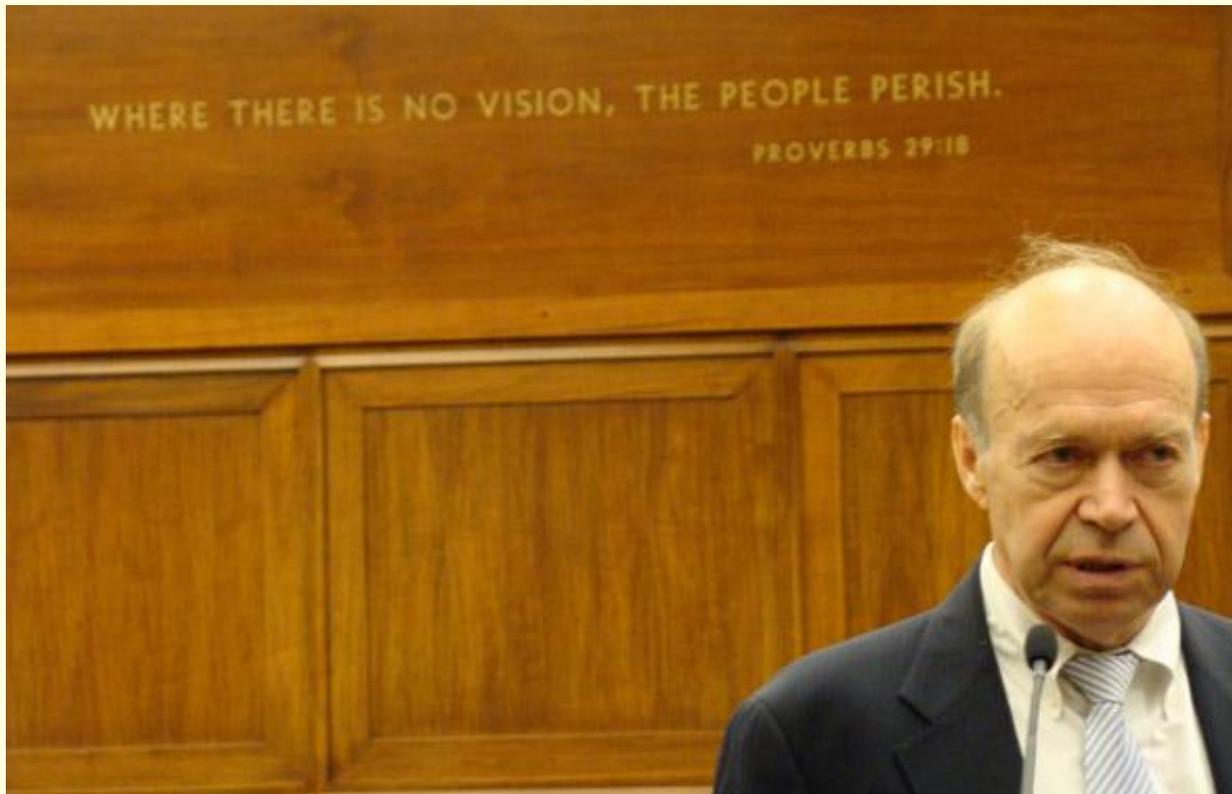
(2) Scientists use their professional status and prestige to try to influence political process or outcomes.

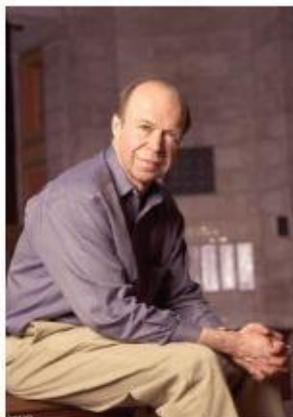
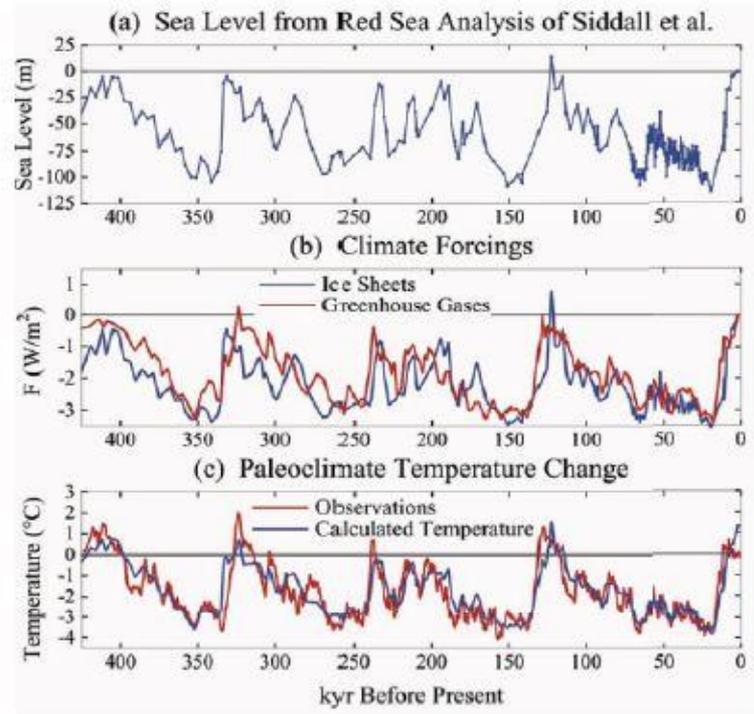
# Ethically Problematic Modes of Communication: Advocacy

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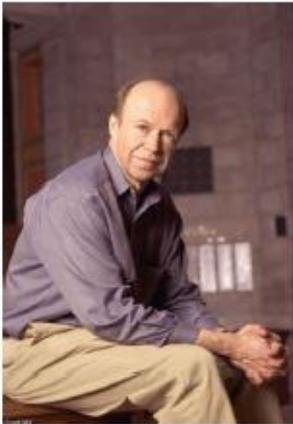
Example for consideration:

James Hanson, NASA Goddard Institute

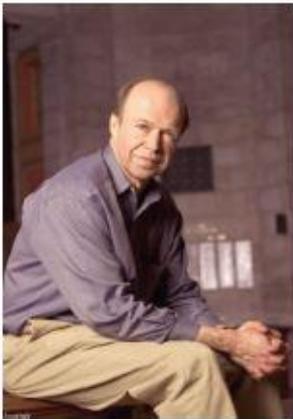


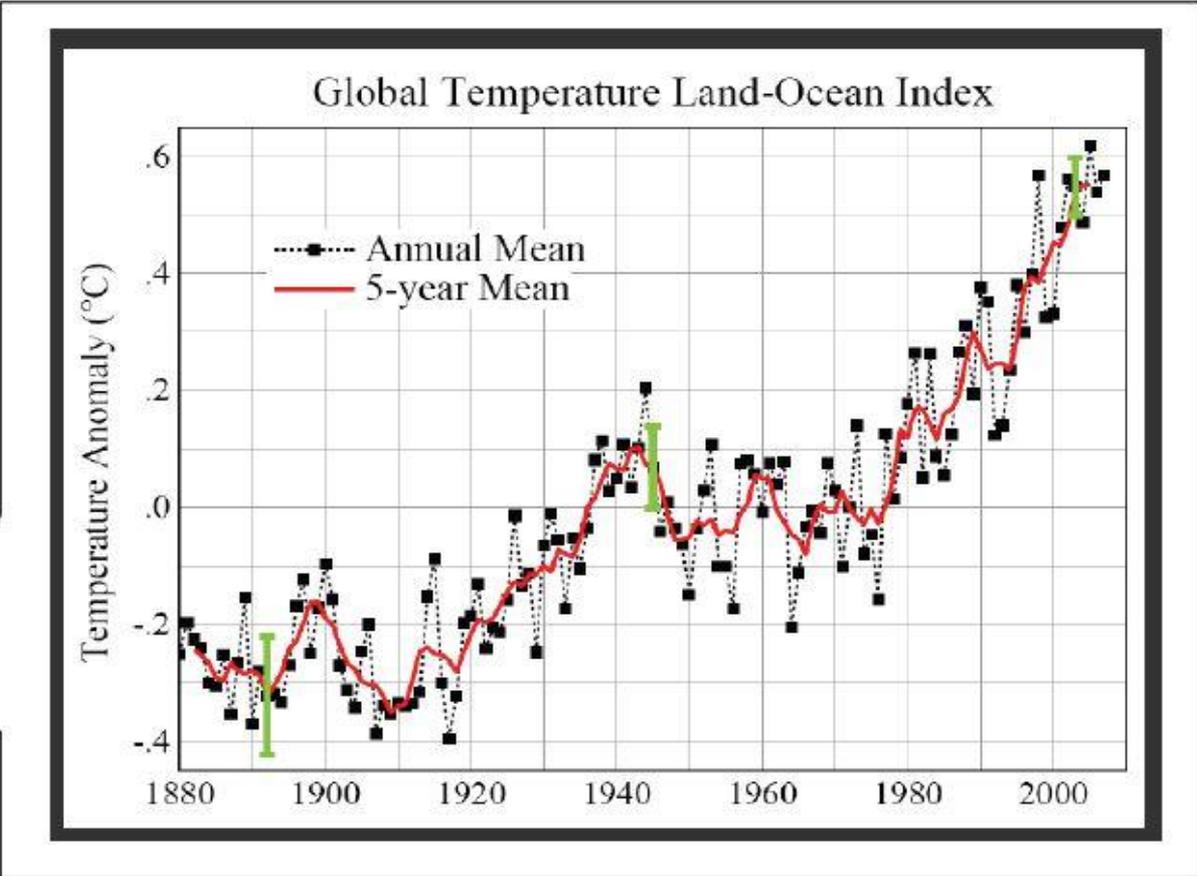
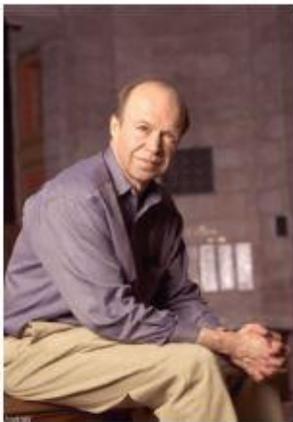


Principal results from the experiments are as follows: (1) Global warming [will occur] to the level attained at the peak of the current interglacial and the previous interglacial [periods].



Mountain glaciers are the source of fresh water for hundreds of millions of people. These glaciers are receding world-wide, in the Himalayas, Andes and Rocky Mountains. They will disappear, leaving their rivers as trickles in late summer and fall, unless the growth of carbon dioxide is reversed.



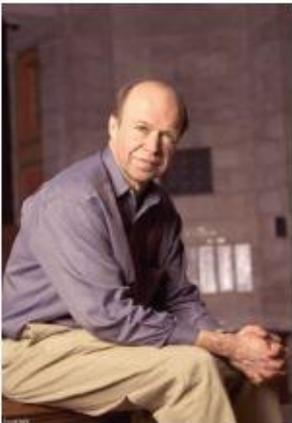


## The Challenge

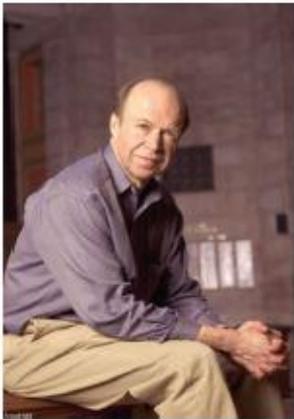
**We can avoid destroying creation!  
(+cleaner planet, + good jobs!)**

**We have to figure out how to live  
without fossil fuels someday...**

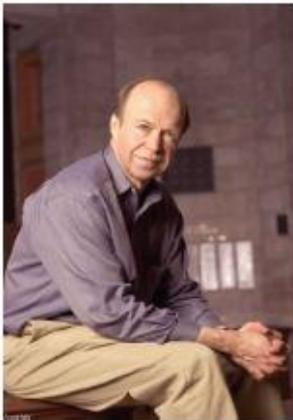
**Why not now?**



A price on emissions that cause harm is essential. Yes, a carbon tax. Carbon tax with 100 percent dividend is needed to wean us off fossil fuel addiction. Tax and dividend allows the marketplace, not politicians, to make investment decisions.



CEOs of fossil energy companies know what they are doing and are aware of long-term consequences of continued business as usual. In my opinion, these CEOs should be tried for high crimes against humanity and nature.



# Elizabeth Bertelson, 2011 Report on Advocacy in Science Communication (ISU).

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- ***First slide:*** <17:0>
- ***Second slide:*** <14:2>
- ***Third slide:*** <17:0>
- ***Fourth slide:*** <17:0>
- ***Fifth slide:*** <14:2>
- ***Sixth slide:*** <9:7>
- ***Seventh slide:*** <5:11>
  
- **<#Appropriate: #Too politicized>**

# Advocacy as an Ethical Issue?

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- Comment: Just because many people (even a majority) judge some remark or action to be wrong (or morally problematical) it doesn't follow that it *was* wrong. This study shows us what people think, not what's true.

“CEOs of fossil energy companies know what they are doing and are aware of long-term consequences of continued business as usual. In my opinion, these CEOs should be tried for high crimes against humanity and nature.” -James Hanson

# Advocacy as an Ethical Issue?

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- Note “priming” effect: Would people judge the last slide to be inappropriate if it weren’t presented in context, with the investigator’s question?

“CEOs of fossil energy companies know what they are doing and are aware of long-term consequences of continued business as usual. In my opinion, these CEOs should be tried for high crimes against humanity and nature.”

--James Hanson

# StarTribune

## Too much advocacy? Scientists and public policy

Article by: GREG BREINING

September 9, 2012 - 1:46 PM

James Hansen, director of the NASA Goddard Institute for Space Studies, recently wrote in the New York Times that if Canada continues to pump oil from its tar sands, "it will be game over for the climate." This from the same climate scientist who warned three years ago, "We're toast if we don't get on a very different path."

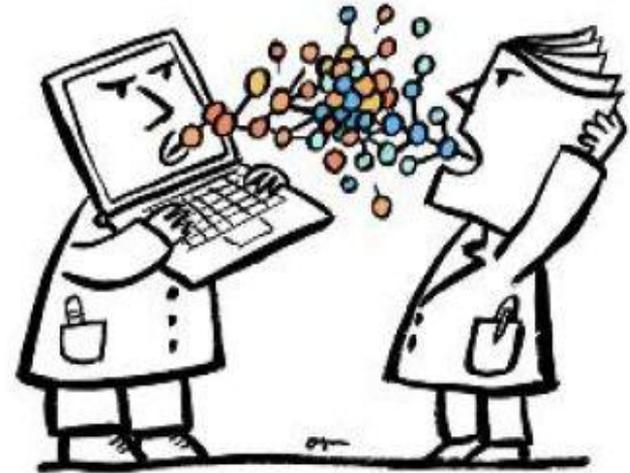
Hansen may be a scientist, but neither statement is scientific.

It's not clear what "game over for the climate" means – either for the climate or for humans. His statement doesn't take into account that Canada's oil sands are a tiny fraction of the world's supply of fossil fuels. And the ramifications of climate on human life and industry lie well outside Hansen's expertise.

Hyperbolic and emotional as they are, these statements are examples of a scientist speaking not as a scientist, but as an advocate. They address policy, not science. And for these kinds of proclamations, Hansen is embraced by environmentalists and excoriated by climate-change deniers.

But what about all the people in the middle? People who may be willing to accept that the globe is warming, that humans are probably responsible, but still wonder what we might do about it?

Most likely, their bullshit detectors just went on high alert.



John Overmyer, NewsArt

# Ethically Problematic Modes of Communication: Advocacy

- Are there contexts where the effort to avoid 'advocacy' is itself misleading?



# Ethically Problematic Modes of Communication: Advocacy

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## **Hypotheses about the Ethics of Advocacy:**

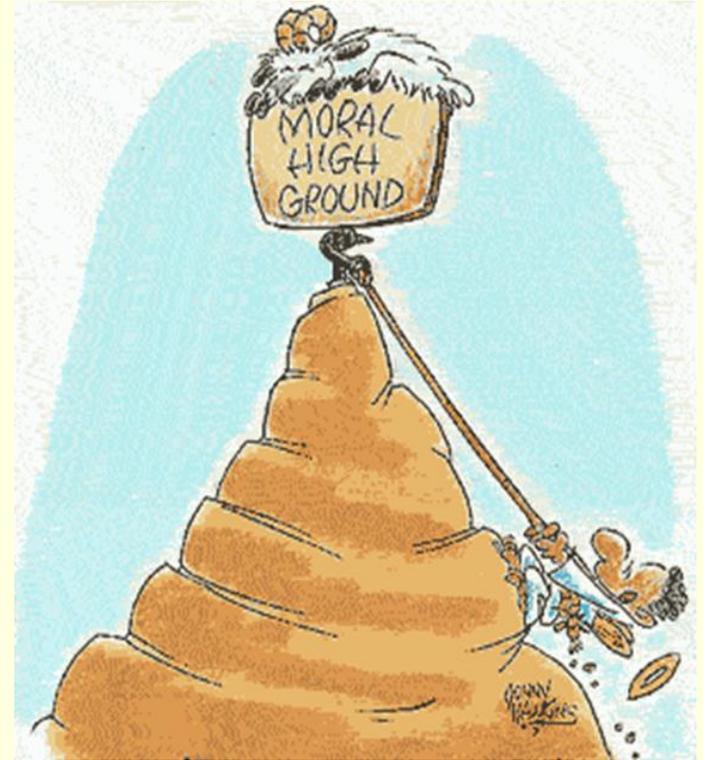
- There is no duty to avoid advocacy, but advocacy may still sometimes be wrong, inappropriate, or unwise.
- Decisions about advocacy are cost-benefit decisions: one weighs the cost (to reputation or to public perception of science) against the benefits (possible positive outcome of advocacy activities).

# Ethically Problematic Modes of Communication: Advocacy

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## **An Objection:**

Is this “cost/benefit” approach too politically calculating? Shouldn’t scientists simply report within their area of expertise, and let the chips fall where they may?



## **Response to this objection?**

# Ethically Problematic Modes of Communication: Advocacy

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## Possible Responses:

- 1) There's no way around this cost/benefit approach in highly politicized contexts.
- 2) Advocacy is not “Machiavellian” unless there is an intent to deceive.



# Ethically Problematic Modes of Communication: Framing

- **Framing:** Presenting information in a way that makes it more likely that the receiver will understand this information in the way the presenter intends or desires.



# Ethically Problematic Modes of Communication: Framing



# Ethically Problematic Modes of Communication: Framing

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**“Framing is inevitable. Spin is optional.”  
-Chris Mooney**

# Ethically Problematic Modes of Communication: Framing

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## Hypotheses about Framing:

- 1) Framing is unavoidable. When framing is unethical or wrong, it is wrong because it is inappropriately *deceptive or misleading*.
- 2) Framing, in at least a minimal sense, is involved whenever a speaker appropriately identifies her audience, thinking about what matters to a representative audience member and how to ‘hook’ audience interest.

# Ethically Problematic Modes of Communication: Hype and Spin

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**Spin:** To *spin* one's research results is to present or describe them in a selective mode that emphasizes the positive and de-emphasizes the negative.

**Hype:** To *hype* one's research results is to present them in a mode that extravagantly celebrates their positive features. Hype may involve the use of words or communication formats that make one's work appear to be more exciting, more "breakthrough-like" than it really is.

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David Adam

Researchers who talk to the press prematurely about unpublished research could soon face harsher sanctions than the odd disapproving glance from a colleague. Under research misconduct guidelines just released by an association of British medical charities, they could be blacklisted for funding, the head of the association says.

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# Hype and Spin: A Tragic Example Arsenate Bacterium Debacle

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- October 2010:  
NASA Astrobiology  
Unit announces a  
prospective news  
conference that will  
“impact the search  
for extraterrestrial  
life,” to take place on  
2 December 2010.



????????????????????

# Hype and Spin: A Tragic Example Arsenate Bacterium Debacle

Science. 2010 Dec 2.

## A Bacterium That Can Grow by Using Arsenic Instead of Phosphorus

Wolfe-Simon F, Blum JS, Kulp TR, Gordon GW, Hoefft SE, Pett-Ridge J, Stolz JF, Webb SM, Weber PK, Davies PC, Anbar AD, Oremland RS.

NASA Astrobiology Institute, USA.

### Abstract

Life is mostly composed of these six elements making it possible that some other bacterium, strain GFAJ-1, uses arsenic instead of phosphorus to substitute for phosphate, most notably in nucleic acids. This discovery has profound evolutionary and geoc



phosphorus. Although matter, it is theoretically possible, we describe a bacterium which substitutes arsenic for phosphorus in nucleic acids that normally contain phosphorus. Although matter, it is theoretically possible, we describe a bacterium which substitutes arsenic for phosphorus in nucleic acids that normally contain phosphorus. Although matter, it is theoretically possible, we describe a bacterium which substitutes arsenic for phosphorus in nucleic acids that normally contain phosphorus.



# Hype and Spin: A Tragic Example Arsenate Bacterium Debacle

- Bacterium named GFAJ-1 (!?)
- Felicia Wolfe-Simon *immediately* rose to rock-star status:
  - Named among the 100 most influential scientists in TIME
  - Spread in GLAMOUR magazine.



*Felicia Wolfe-Simon is not your average science geek. She plugs the electric bus, jugs under the handle irrigation and wears a space ring. But last year the NASA astrobiologist led a team that published a study offering compelling evidence of the possibility of life on other planets. The results sparked controversy in the scientific community, but Wolfe-Simon, who lives in the Bay Area with her junior-high saxophonist-turned-husband (above), stayed above the fray and focused on her work. Her advice for keeping your eye on the ball:*

### No. 1 Focus on What You Don't Like

"Ask yourself: What's the part of my job I like the least, and why? If it's because you're not good at it, practice. You'll get better!" says Wolfe-Simon. "I've had to relearn things that at the time I thought, I can't stomach any more of this." Concentrating on your weaknesses is the best way to get past them—and move up, she says. Besides, "you may end up being great at the tasks you couldn't wait to get away from."

### No. 2 Don't Suck Up, Read Up

Before her NASA study underwent a rigorous peer review, Wolfe-Simon made sure to introduce herself to "rock-star scientists" at conferences, telling them she admired their work before asking for their feedback on hers. "If you're looking for advice from a heavyweight in your field," she says, "you have to show that you've taken the time to learn what they've done—and cite specific examples!"

### No. 3 Find Your Creative Spirit

Wolfe-Simon grew up in Miami as the daughter of a trumpeter, and says music is crucial to getting her creative juices flowing—she's been known to blast Enimem and Macy Gray in the research lab. She also credits her success in science to her training as a classical oboist. "I think that music and arts—watching *South Park* counts!—should be a part of everyone's life, regardless of what you do for a living," she says.

### No. 4 Share the Credit

Though Wolfe-Simon was singled out when her study was released, she said it was really a team effort. "It's not about accolades or rank," she says. "In fact, it's not about me, period. We each had our strengths, and together we could answer more interesting questions and do cooler things than we could have on our own. Knowing how to collaborate may be your most important skill."

# Hype and Spin: A Tragic Example

## Arsenate Bacterium Debacle

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- Tremendous media and press attention.
- Questions immediately arose about the claims made in the paper.
- FW-S defended her work in public and in the press.



- This controversy may have ended FWS's career.

# Hype and Spin: A Tragic Example- The Arsenate Bacterium Debacle

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- Rosie Redfield (UBC) analyzed DNA of GFAJ-1 using liquid chromatography-mass spectrometry and could not detect any arsenic.
- Called this a “clear refutation” and asked that the paper be retracted.



# Hype and Spin: A Tragic Example Arsenate Bacterium Debacle

■ Arsenic *preference*,  
or arsenic *tolerance*?

■ Questionable  
experimental  
design?

■ Overstatement of  
modest or early  
research results?



The image is a screenshot of a news article from the journal Nature. The page has a dark red header with the 'nature' logo and the tagline 'International weekly journal of science'. Below the header is a navigation bar with links for Home, News & Comment, Research, Careers & Jobs, Current Issue, Archive, and Audio & Video. A secondary navigation bar shows 'News & Comment', 'News', '2012', 'October', and 'Article'. A yellow banner below the navigation bar reads 'Commendations for Nature News & Comment in the 2012 Online Media Awards'. The main content area is titled 'NATURE | NEWS' and features the headline '‘Arsenic-life’ bacterium prefers phosphorus after all'. A sub-headline states 'Transport proteins show 4,000-fold preference for phosphate over arsenate.' The author is 'Daniel Cressey' and the date is '03 October 2012'. The text begins with 'A bacterium that some scientists thought could use arsenic in place of phosphorus in its DNA actually goes to extreme lengths to grab any traces of phosphorus it can find.' A photograph on the right shows a lake with yellow mineral deposits and snow-capped mountains in the background. The text continues: 'The finding clears up a lingering question sparked by a controversial study<sup>1</sup>, published in Science in 2010, which claimed that the GFAJ-1 microbe could thrive in the high-arsenic conditions of Mono Lake in California without metabolizing

# Hype and Spin: A Tragic Example

## Arsenate Bacterium Debacle

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**What went wrong here?**

- **Cognitive Error:** Misreading experimental results.
- **Communication Disaster:** ‘Hyping’ modest results.
- **Public Relations Disaster:** “Cringe-worthy” press conference.
- **Post-Critique Response:** Wolfe-Simon dug her heels in.

# When is 'Hype' ethically wrong?

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## **Hypothesis about the ethics of Spin and Hype:**

Unethical “hype” is a form of misrepresentation. It involves dishonestly representing one’s research results as more momentous or more certain (more \_\_\_\_\_?) than they really are.

**Problem:** All simplification involves some ‘misrepresentation.’ When is the line crossed?

# Hype and Spin: A Tragic Example Arsenate Bacterium Debacle

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## My Analysis (entirely disputable!):

- FWS was a true believer (no intentional misrepresentation).
- *Should* have been more skeptical about her research results.
- May have been goaded by NASA and given bad advice and inadequate support from senior co-authors (esp. Paul Davies) who should have protected her.

# Upshot:

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- There are indeed ethical issues involved in wind power generation and in science communication.

# Upshot:

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- Scientists involved in new, controversial, transformative research, or whose work is the subject of public discussion and debate *need to know their critics*, and to take them seriously.

# Upshot:

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- Failure to be aware of and thoughtful about these issues can be disastrous and tragic.



# Upshot:

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- We can't avoid ethical challenges associated with scientific research by pretending that they do not exist.



# Thank you!

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