

Responsibilities of Scientist to Society

# OUTREACH IS IMPORTANT

photos & slides by Xiashan Huang



Public ← OUTREACH → Scientist



# Public's View on Scientist



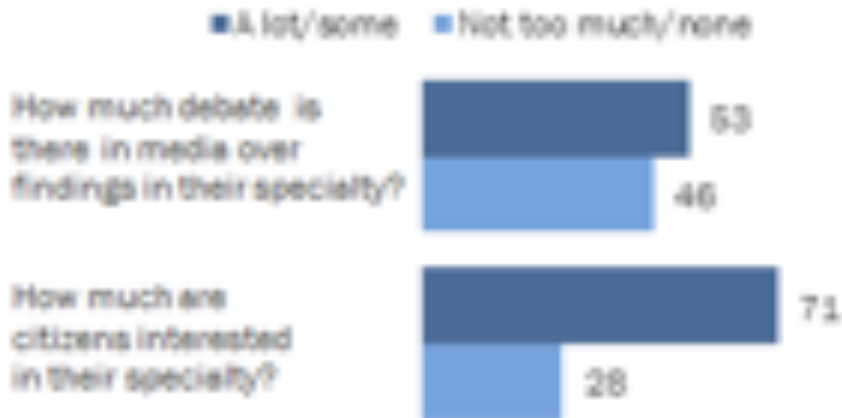
Attitude Spectrum →

# Public's View on Scientist

- Probably better than thought!

## Most Scientists Perceive Both Interest in and Debate over Their Work

% of AAAS scientists on debate in the media and citizens' interest in their specialty



AAAS scientist survey Sept. 11-Oct. 13, 2014. Q47-48. Those giving no answer are not shown.

PEW RESEARCH CENTER

## Nearly All Scientists Talk with the Public; A Sizable Share Use Social Media, Blogs

% of AAAS scientists who ever do each of the following



AAAS scientists survey Sept. 11-Oct. 13, 2014. Q50a-f. Ever use social media based on combined responses to Q50i.e. Ever blog based on combined responses to Q50a,f. Responses of never and no answer are not shown.

PEW RESEARCH CENTER

(Pew Research Center 2015 Feb: *How Scientist Engage Public*)

# Public's View on Scientist

- Probably better than thought!

Primary discipline	Amount of media debate		Amount of public interest	
	A lot/ some	Not too much/ none	A lot/ some	Not too much/ none
Biomedical	59	40	77	23
Chemistry	32	65	49	50
Earth sciences	67	33	80	20
Engineering	35	65	57	43
Physics and astronomy	40	59	68	31
Math and computer sciences	33	67	57	43
Social, history, policy	70	29	83	16

AAAS scientist survey Sept. 11-Oct. 13, 2014. Q47-48. Those giving no answer are not shown. Those with some other primary discipline not shown.

**PEW RESEARCH CENTER**

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# Public's View on Scientist

- A Case in Astronomy:  
Shaping Student's Attitude by Introductory Astronomy Class

(3.30, 4.19) Most of the atoms in your body were once inside a star.

(3.47, 4.22) We can't know what happened in the distant past because we don't have any observations of that time.

(2.87, 3.51) The Sun is a special star.

(4.21, 4.43) Science affects everyone's life.

(3.57, 3.78) Science is largely about discovering patterns.

# Public's View on Scientist

- A Case in Astronomy:  
Shaping Student's Attitude by Introductory Astronomy Class

(3.68, 3.68)

(3.70, 3.65)

(3.43, 3.29)

# Public's View on Scientist

- A Case in Astronomy:  
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(3.68, 3.68) I want my tax money to help support science.

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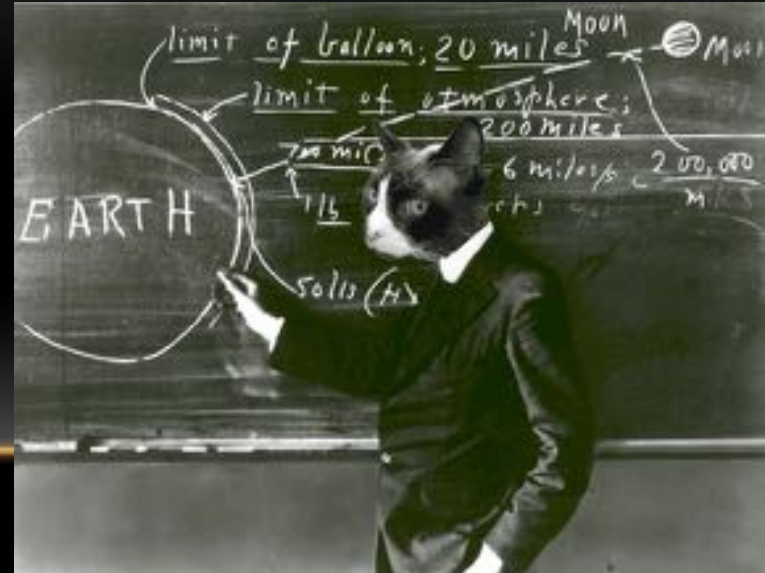
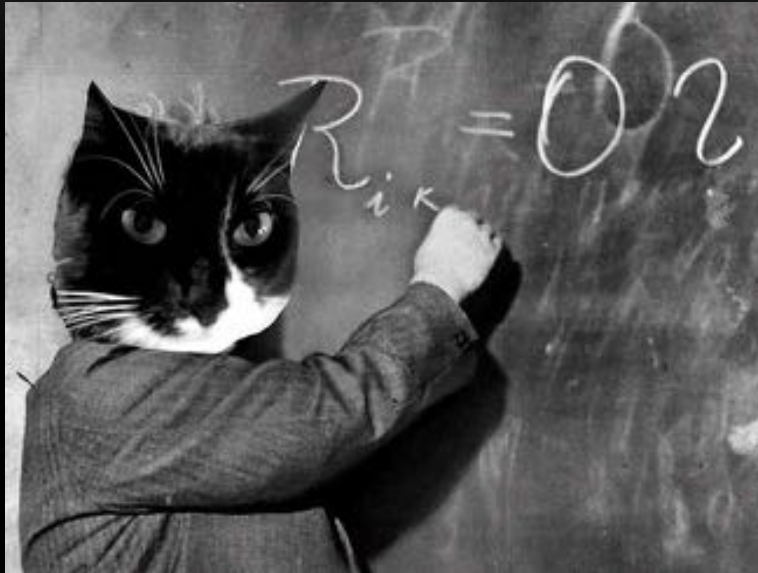
(3.70, 3.65) Science is fun.

(3.43, 3.29) Scientists do experiments: (a) on what interests them the most; (e) on things that could verify or falsify theories.



# Scientist's View on Public

No doubt a positive attitude, but...



- **23%** scientist think time constraints is the major reason stop them from EPO activities
- **60%** thinks everyday work doesn't left them time for out-reach activities.
- EPO activities are not financially advantageous

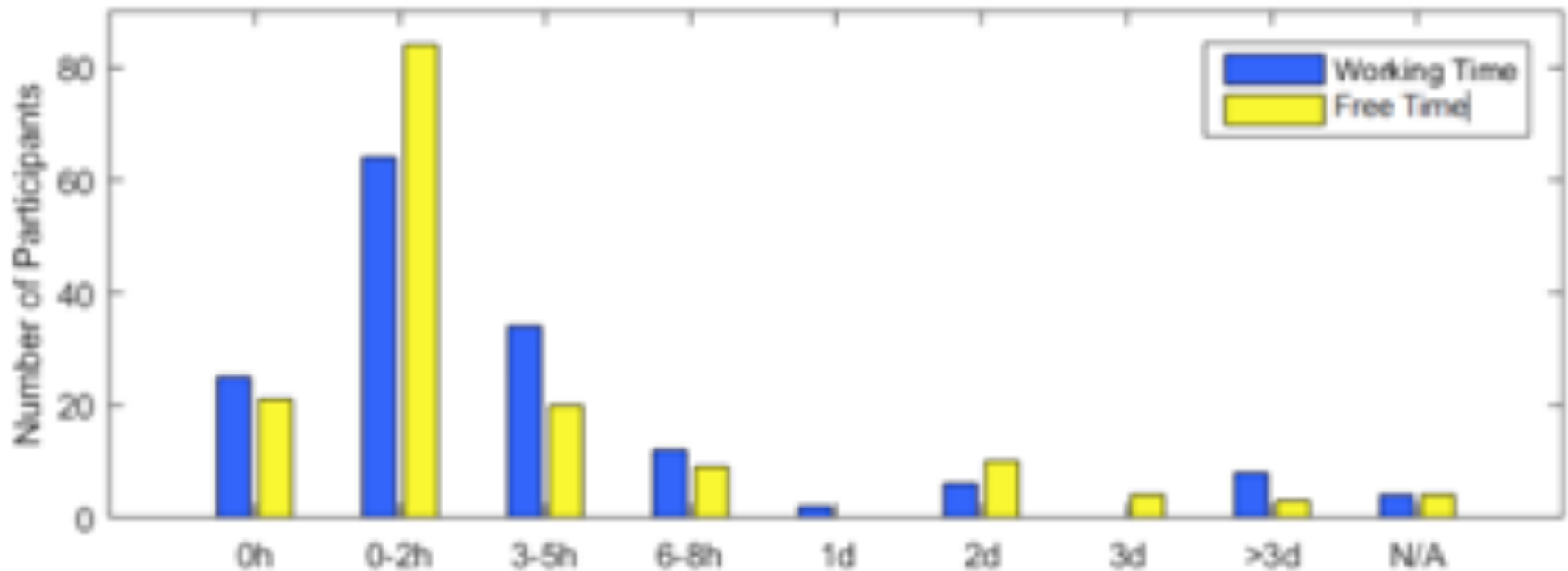
(Welcome Trust 2000: *the role of scientist in society*)

# Scientist's View on Public

- A Case in Astronomy

Global Study: Astronomers' View on Outreach and Education  
(155 astronomers, 31 countries)

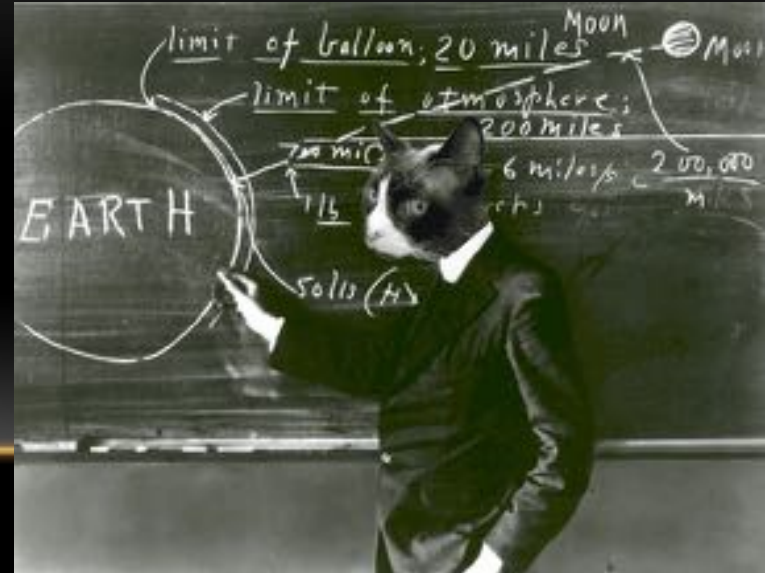
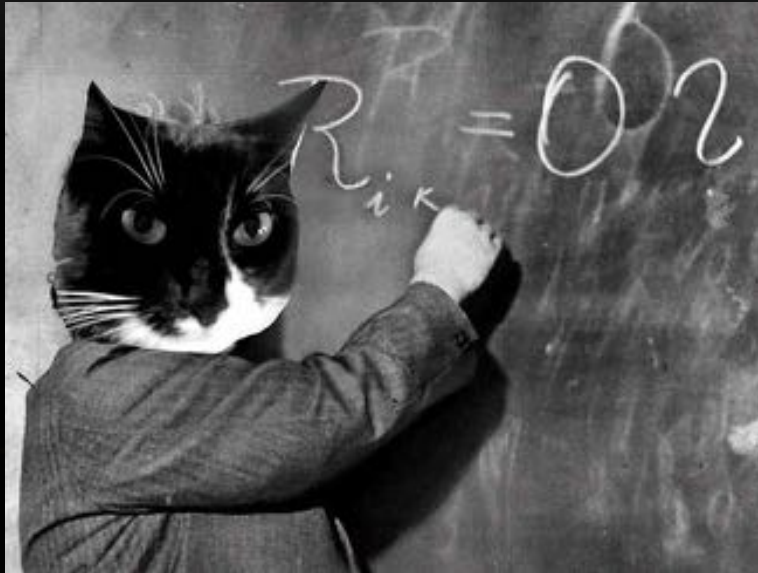
How much time?



(Lisa Dang et al 2015 )

# Scientist's View on Public

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(Welcome Trust 2000: *the role of scientist in society*)

# Scientist's View on Public

## Reality

(116 participants)

- 50/116 people:  
0% of grant money goes to education & outreach
- 15/116 people:  
0%-2% of grant money goes to education & outreach

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## Expectation

(155 participants)

- On average:  
15% of grant money **should** go to education & outreach
- 13/155 people:  
0% of grant money **should** go to education & outreach

# What we have in UVa for now?



Fan  
Public  
Night



What we have in UVa for now?



McCormick  
Public Night



# What we have in UVa for now?

**Dark Skies,**  
**Bright Kids!**

"Awesome club, awesome people" - DSBK parent



# Worth it?

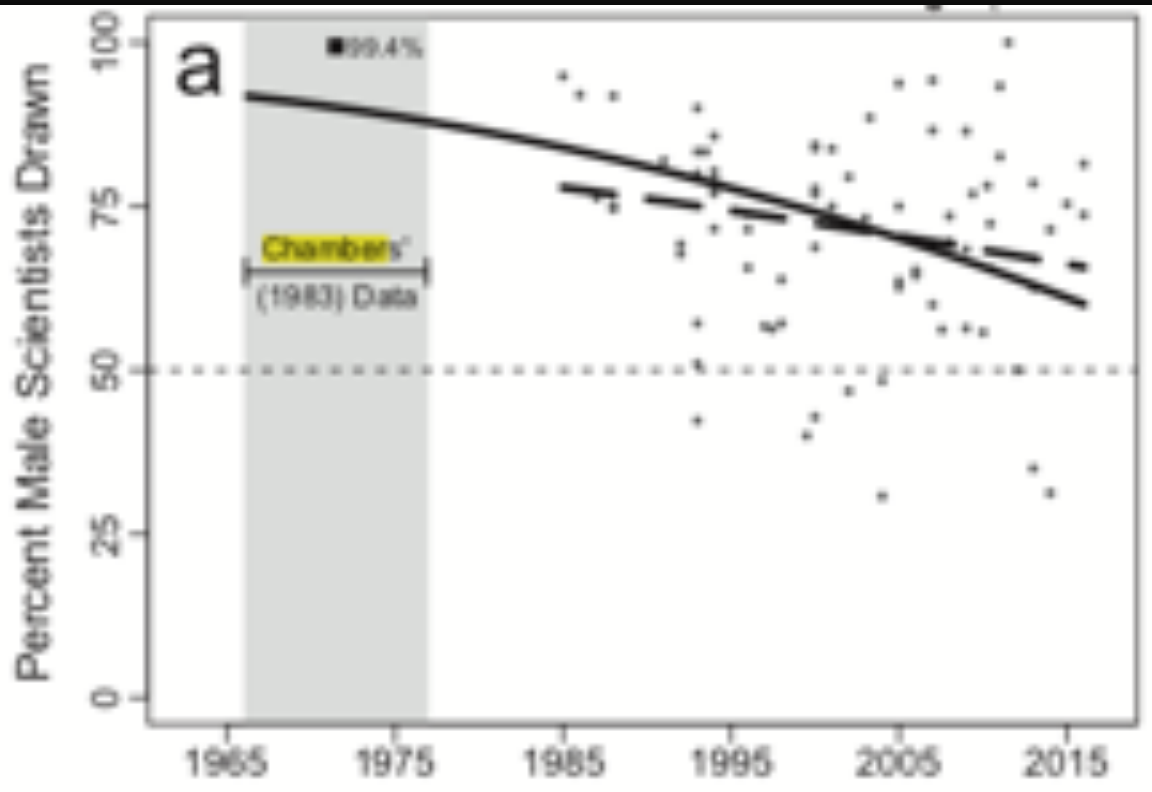
Hard to say yes in short term  
but we should do nevertheless



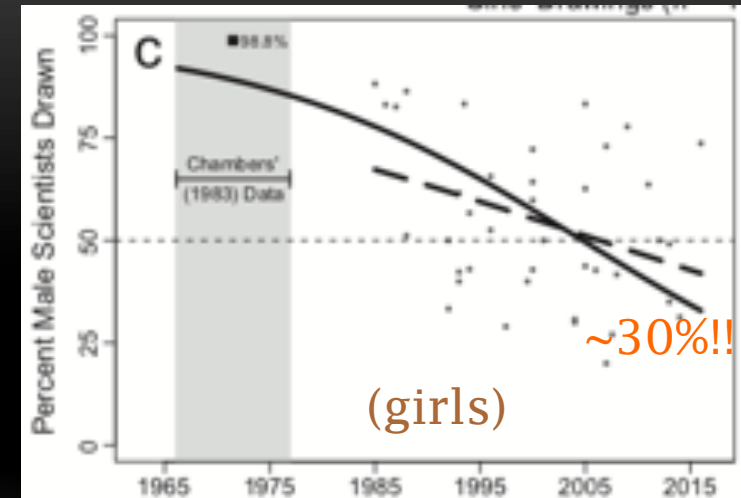


- Eliminate gender stereotype

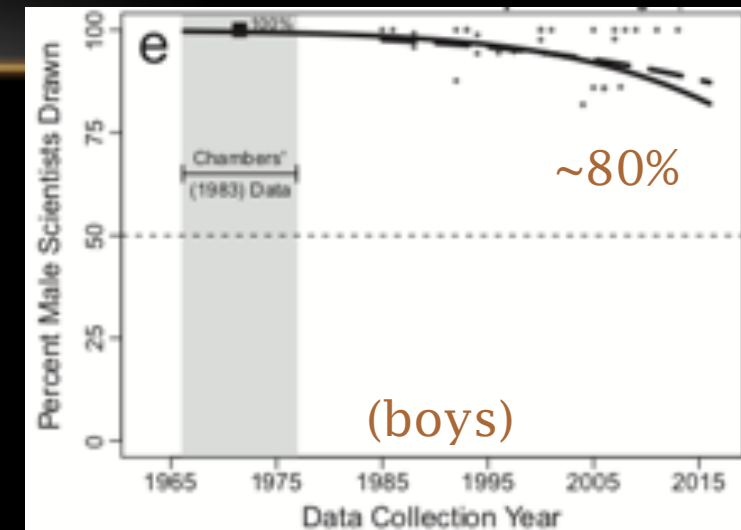
A study over 5 decades  
(Thanks Ian let us know this!)



(All children)

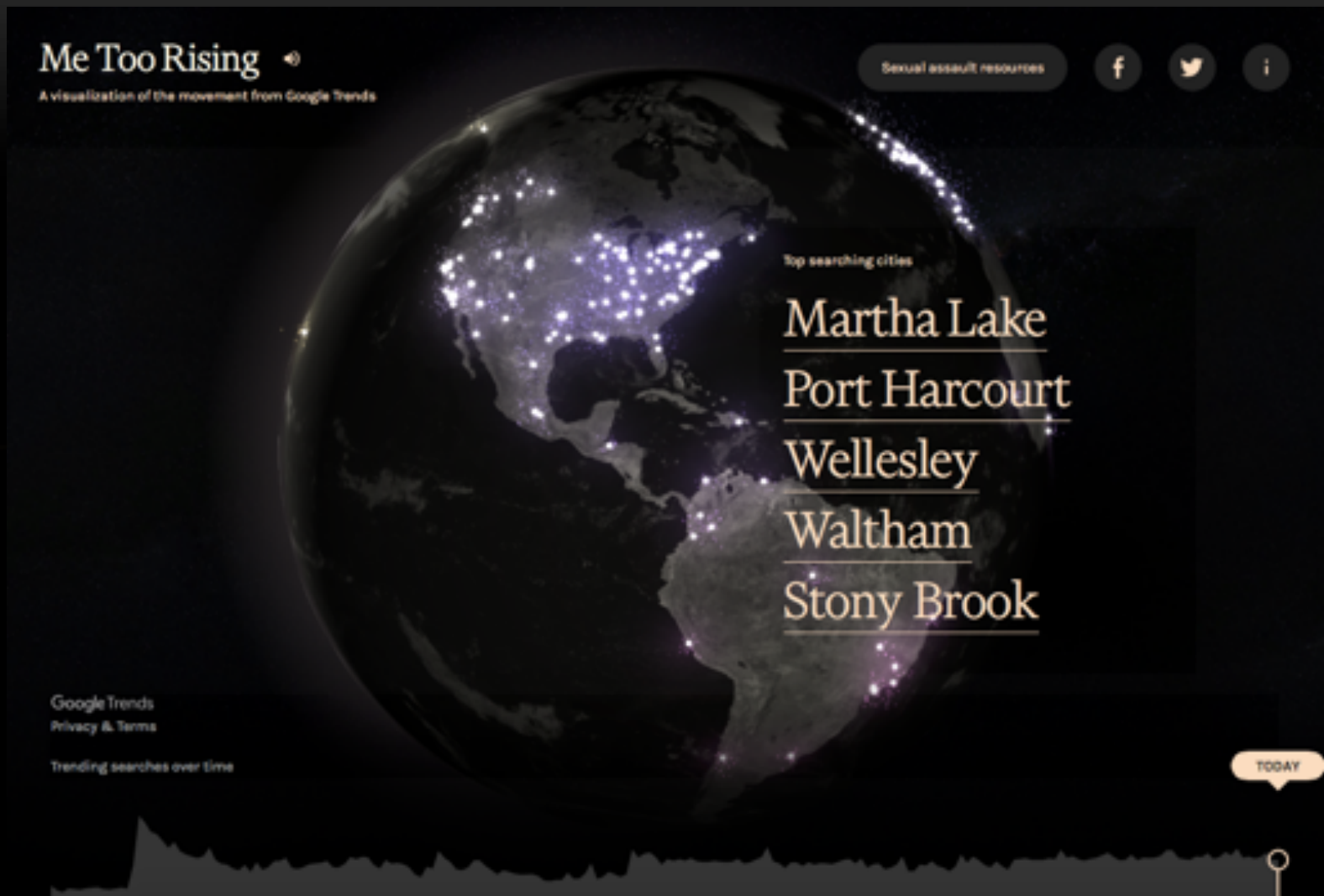


(girls)

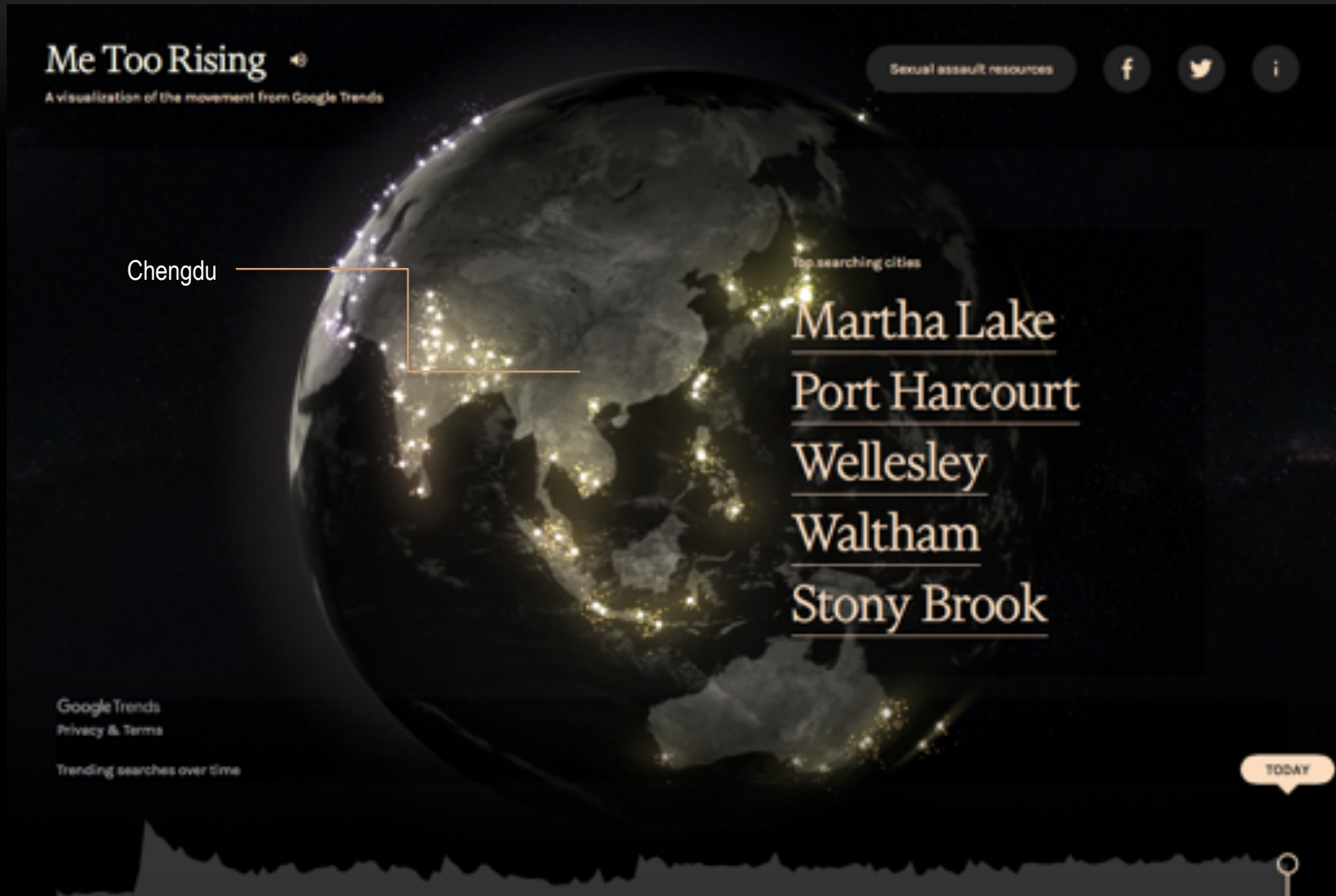


(boys)

- Eliminate information inequality



- Eliminate information inequality



- Eliminate information inequality



- Eliminate information inequality

Washington-Arlington-Alexandria  
DC-VA-MD-WV: 493,651



Financial Gradient  
(GDP data 2015)  
In million dollars

**Whole Province:**

482,517

173,418

3,420

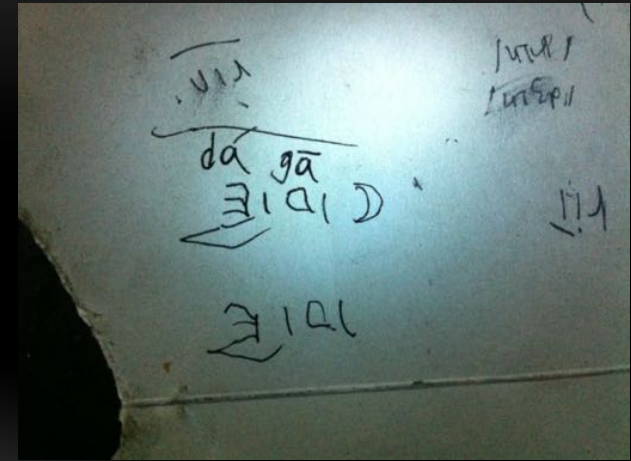
2,111

- Eliminate information inequality



- Up to 2014 ( when I left ), we've been doing this for 6 years,
- 11 rural schools, 2189 students, 239 volunteers from Sichuan University (including me!)

- Eliminate information inequality



- Minority Residency Area ( Tibetan race)

- Eliminate information inequality



- Areas that impacted by the huge 7.8-mag earthquake in 2008,





- Eliminate information inequality

- Sometimes luckily got **sponsored** by big companies' charity projects



Bosma provided telescope



Amazon delivered free books



- Eliminate information inequality - outreach
- What else?



Connection  
Culture  
Knowledge

...

- Eliminate information inequality - outreach
- What Else? Good for astronomers



- High Elevation (over 10,000ft) + Dark Sky = Potential Observatory Site
- The Large High Altitude Air Shower Observatory (LHAASO): HE Astroph

Responsibilities of Scientist to Society

# OUTREACH IS IMPORTANT

photos & slides by Xiashan Huang

- Nowadays, **most scientists** have a **positive attitude** towards science communication and education and public outreach. However, there is still place for **improvement** in the number of scientists taking part in EPO and **the amount of effort that they dedicate to these activities.** (Andrews, 2005; Poliakoff, 2007; Ecklund, 2012)
- The study also disproved the theory that education and public outreach activities were viewed **as a hobby rather than a duty** (Dang, 2015)



Still a lot we can do!