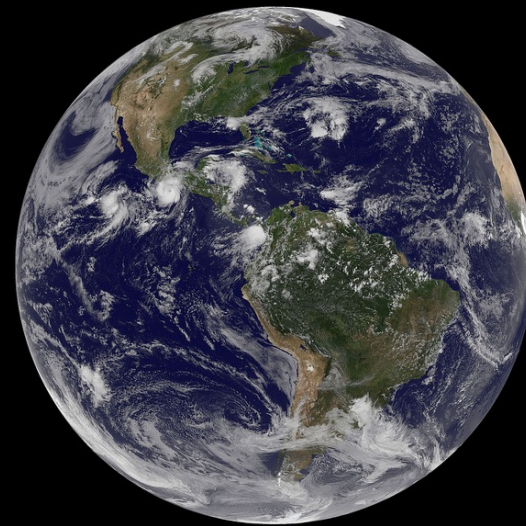


# WHERE DO WE GO FROM HERE?

EARLY-CAREER PERSPECTIVES ON THE  
CHALLENGES AND OPPORTUNITIES FACING  
ECOLOGY IN THE 21ST CENTURY



**Naupaka Zimmerman**, University of Arizona, USA

**Barraquand Frederic**, Swedish University of Agricultural Sciences, Sweden

**Peter Sørensen Jørgensen**, Center for Macroecology, Evolution & Climate, Denmark

**Tim Poisot**, University of Montréal, Canada

**Roberto Salguero-Gomez**, University of Queensland, Australia

**Allison K. Shaw**, University of Minnesota, USA

**Daniel E. Stanton**, University of Minnesota – Twin Cities, USA

@naupakaz   @INNGEcologist   @ESA\_EarlyCareer



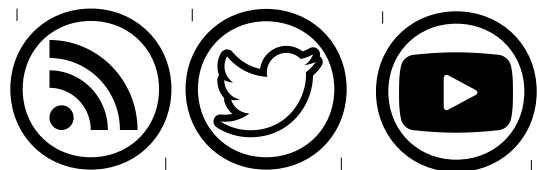
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## slides available at figshare



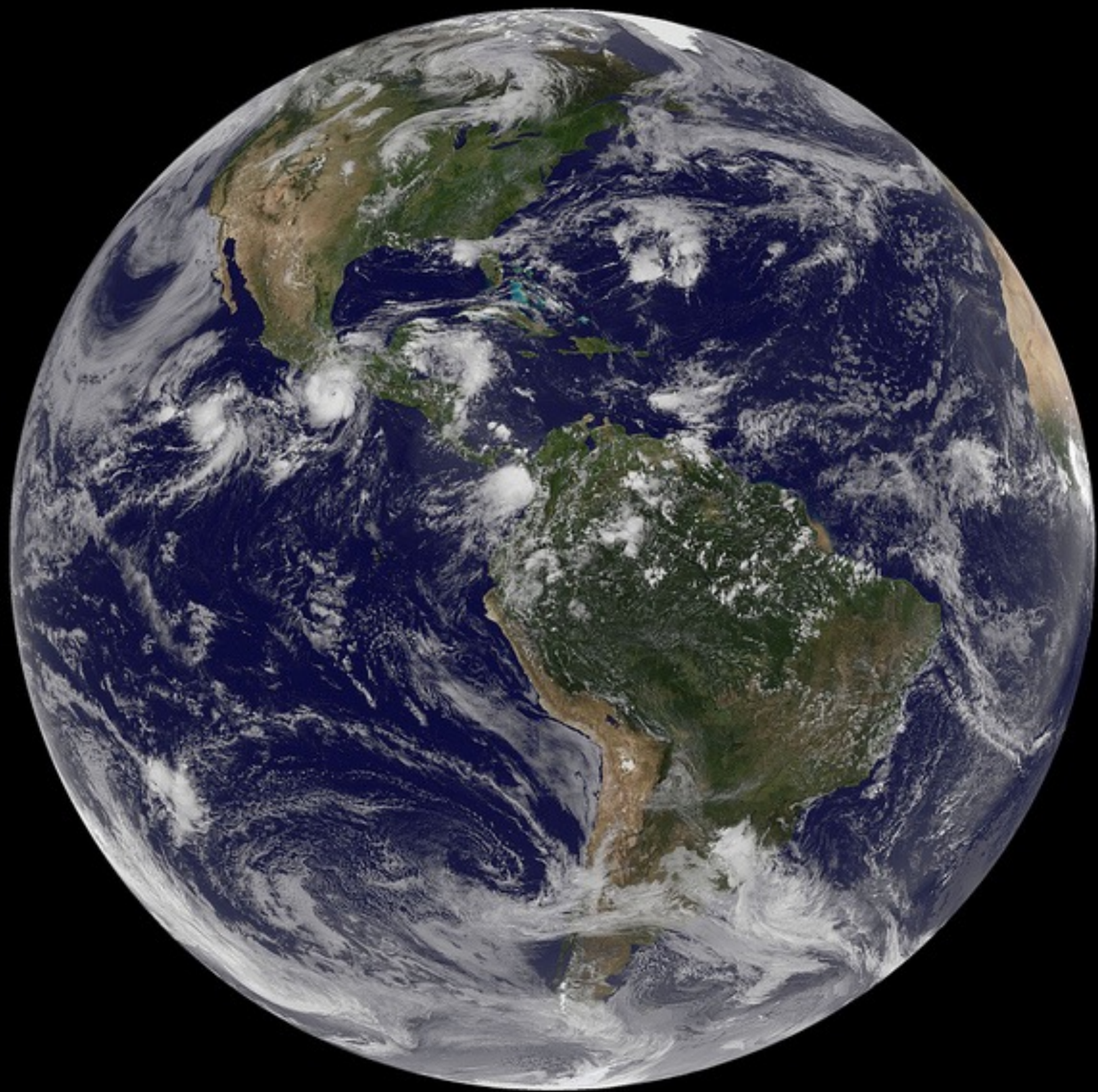


Image by NASA (CC-BY)



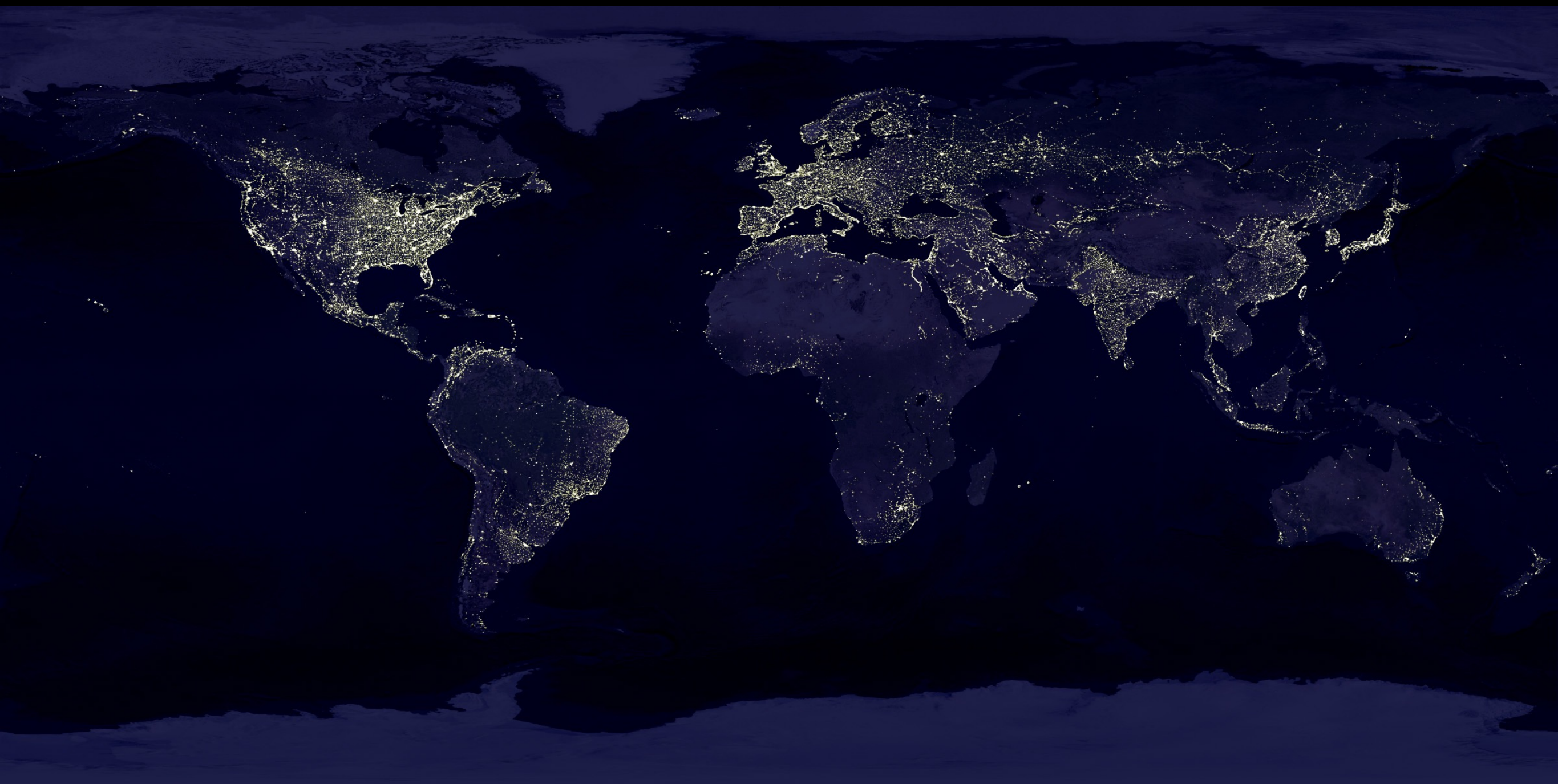
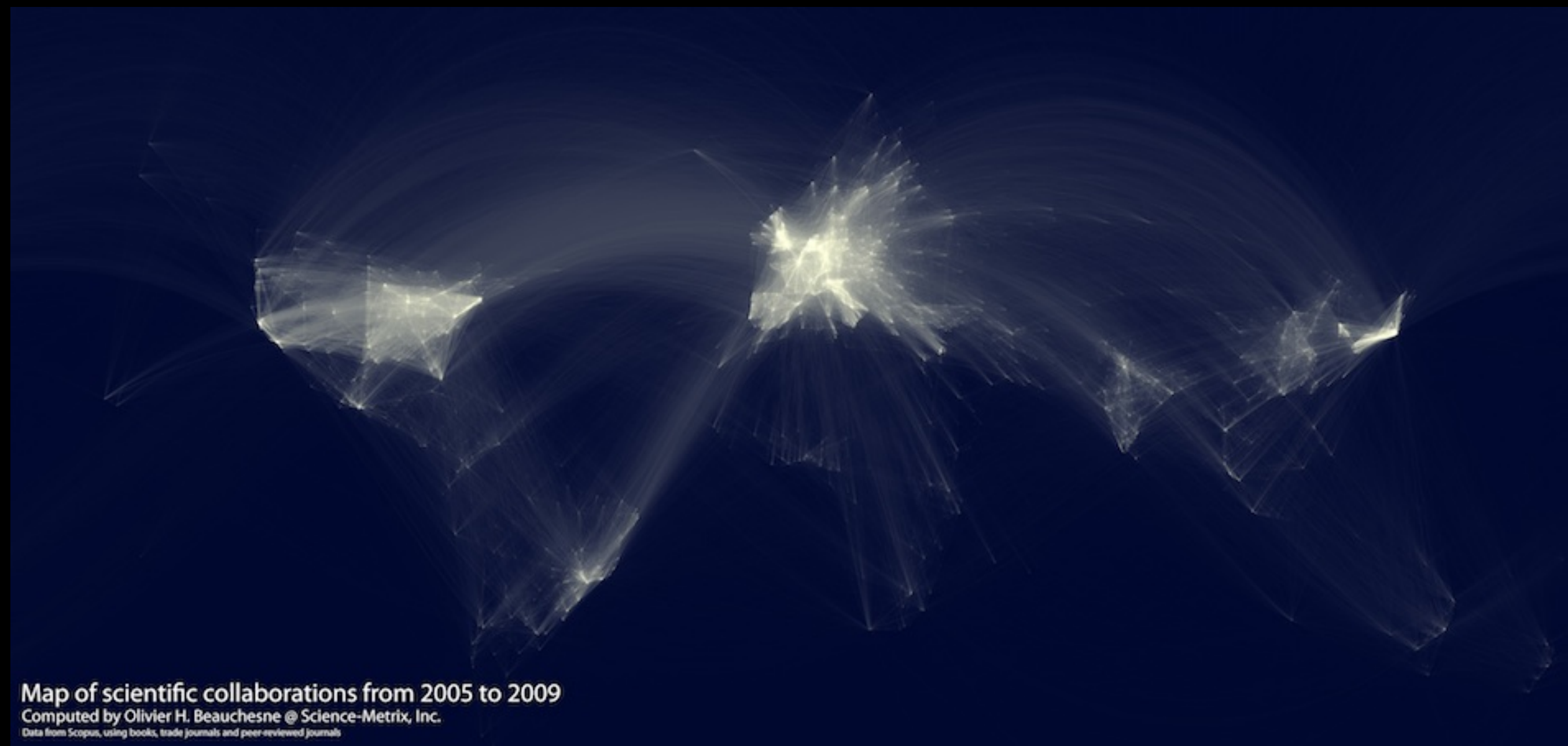


Image by NASA (CC-BY)

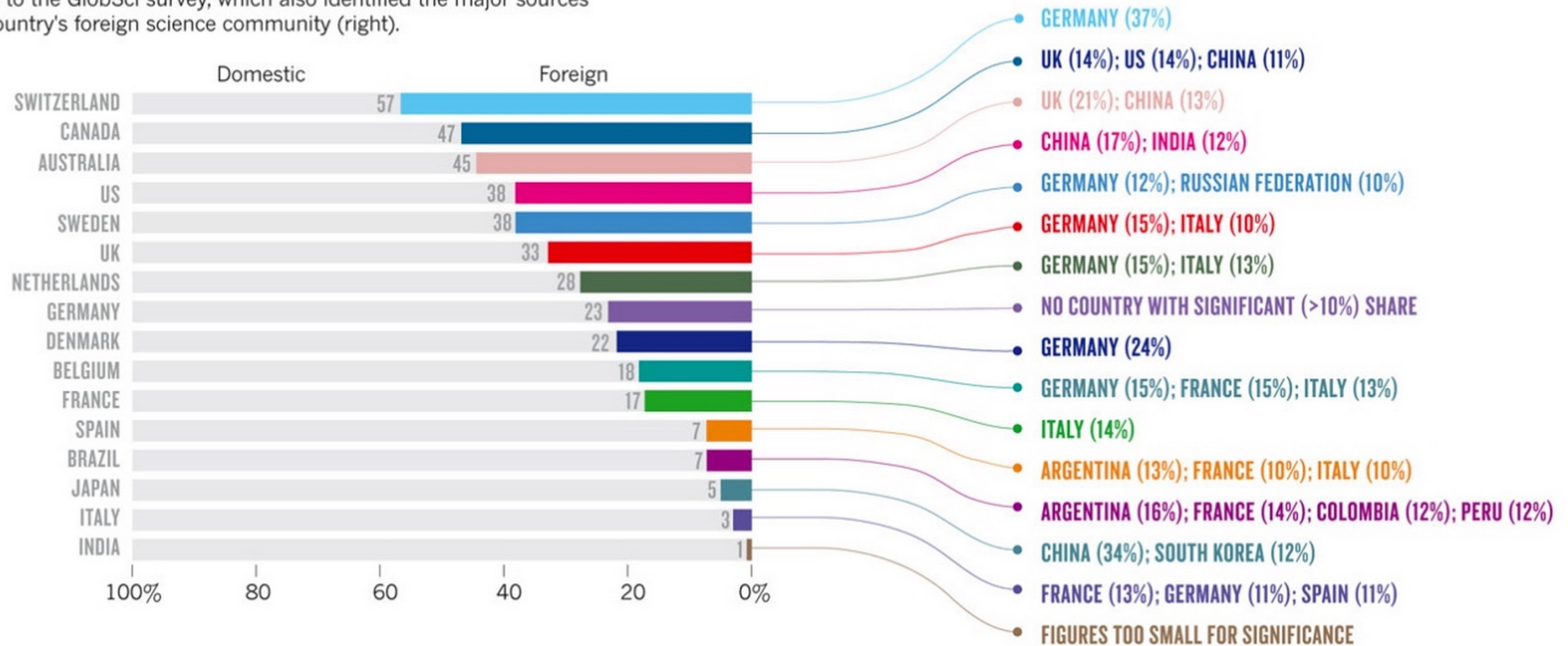


SCIENTIFIC TRAINING IS BECOMING  
INCREASINGLY INTERNATIONAL



## FOREIGN FRACTIONS

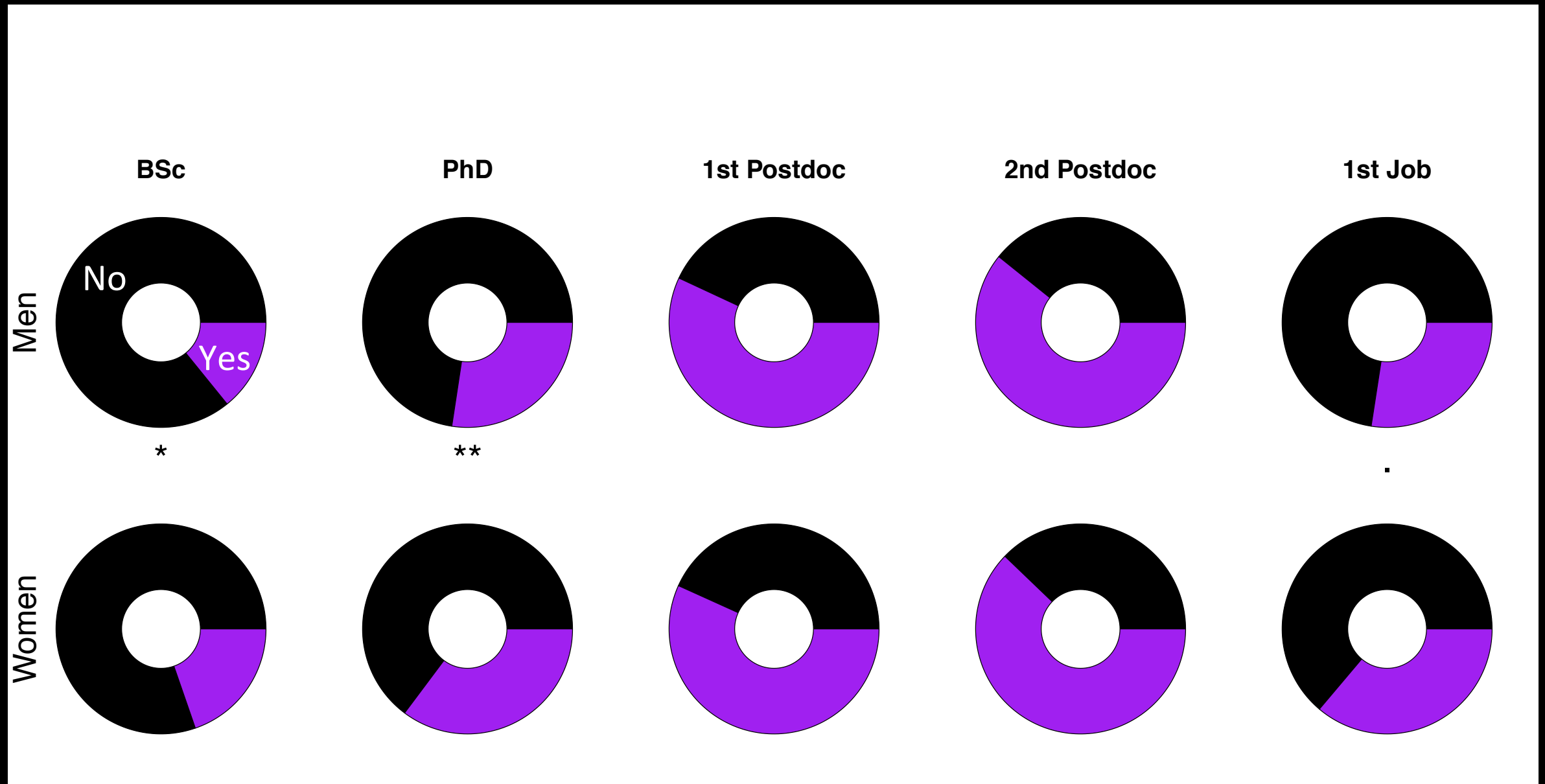
Developed countries have the highest proportions of foreign scientists, according to the GlobSci survey, which also identified the major sources of each country's foreign science community (right).



Van Noorden 2015, Nature, "Global mobility: Science on the move"

Figure copyright Nature Publishing Group, used with permission

# Who goes abroad and when?

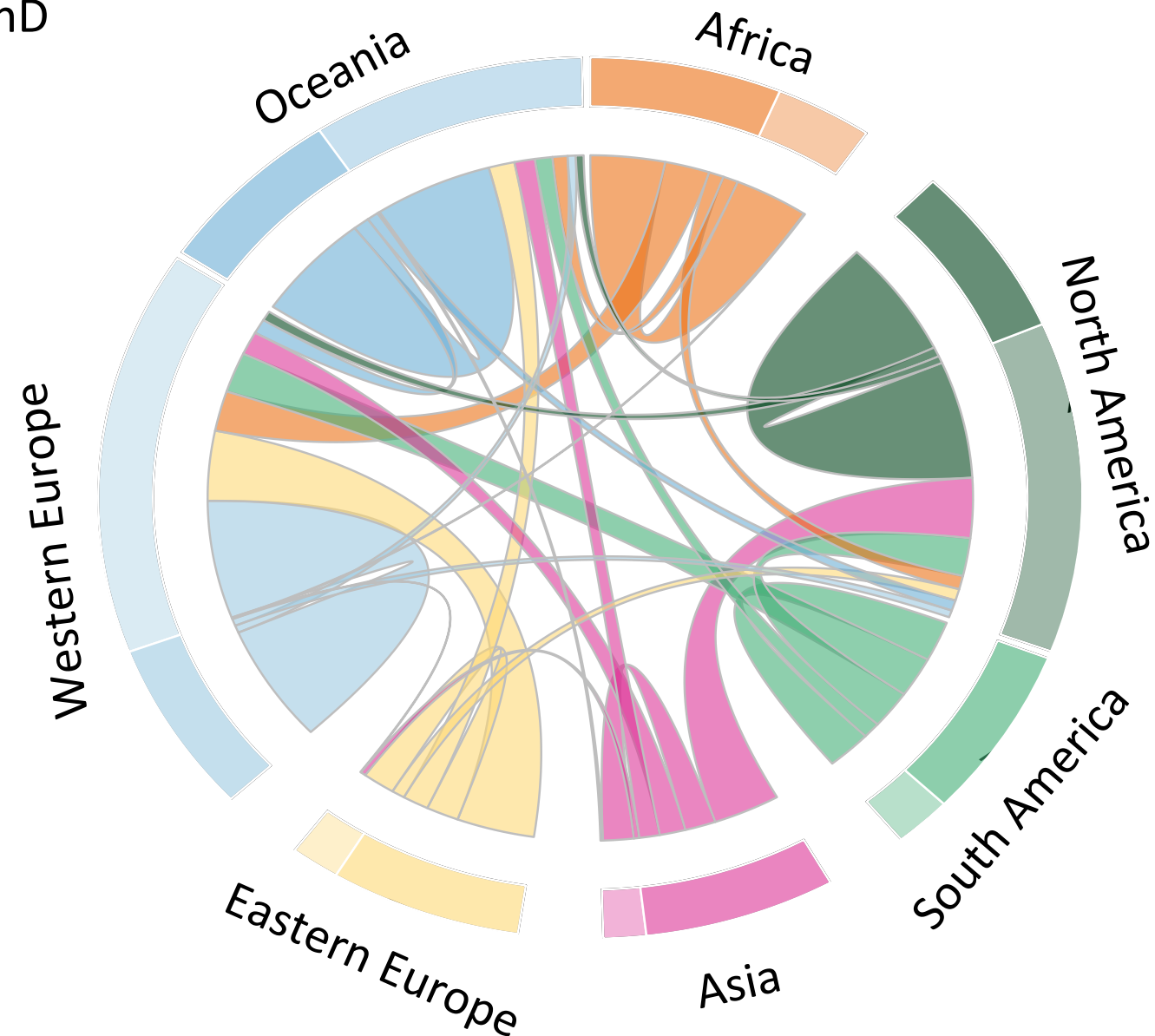


data from an international survey conducted by INNGE (n = 1139)  
led by Rob Salguero-Gomez



# Moving around (or not)

Home country to PhD



data from an international survey conducted by INNGE (n = 1139)  
led by Rob Salguero-Gomez

IT'S NOT AN EASY TIME  
TO BE A POSTDOC

*Contributions*

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## Ecology Postdocs in Academia: Primary Concerns and Possible Solutions

Allison K. Shaw,<sup>1</sup> Daniel E. Stanton,<sup>2</sup> Sarah R. Supp,<sup>3</sup> Amber Budden,<sup>4</sup> Stephanie Eby,<sup>5</sup>  
Pamela L. Reynolds,<sup>6</sup> Roberto Salguero-Gómez,<sup>7</sup> Daniel R. Scholes,<sup>8</sup> Naupaka B. Zimmerman<sup>9</sup>

Shaw et al. 2015, ESA Bulletin



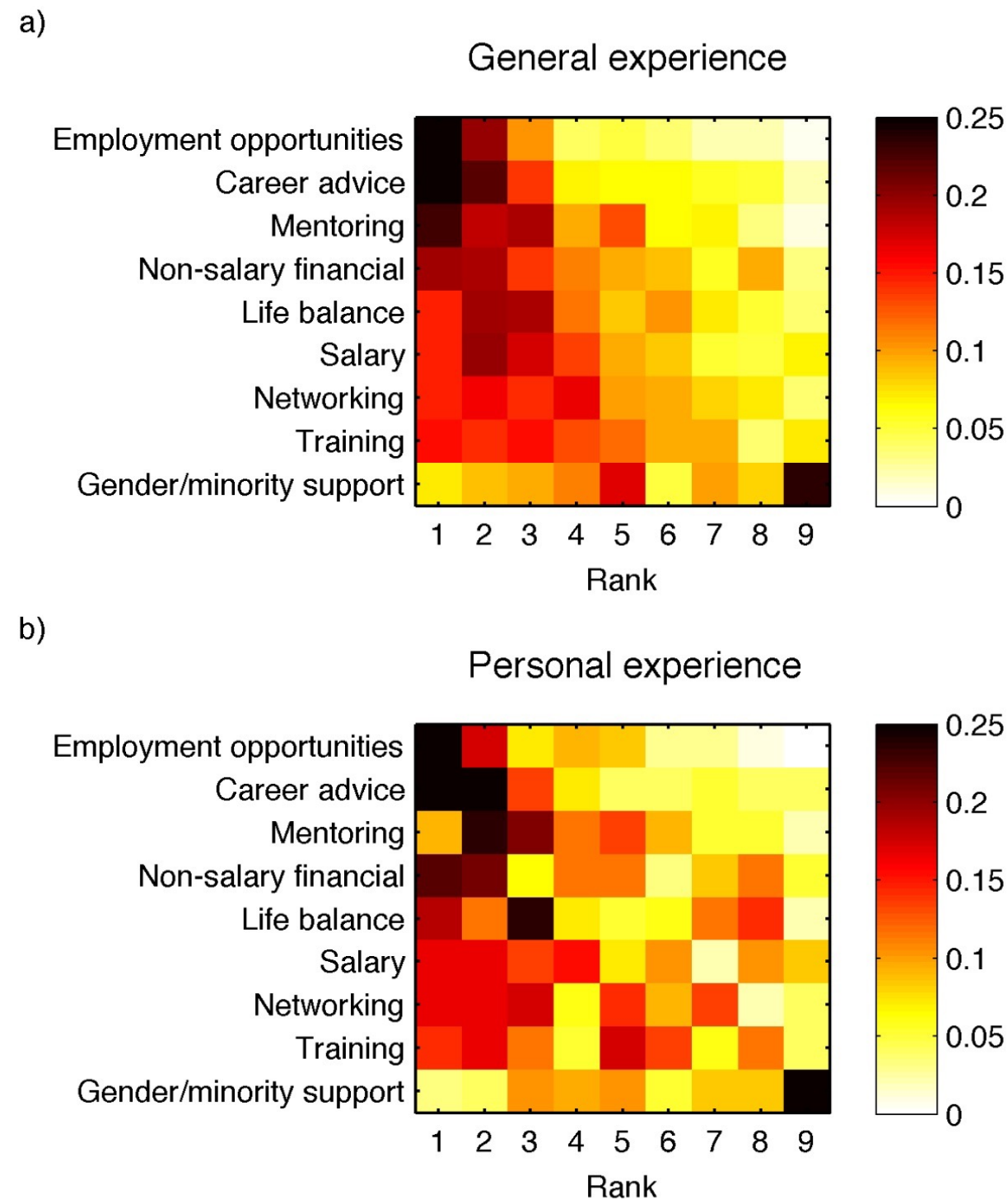


Fig. 1. Responses to survey question 2 (see Box 1). Fraction of respondents (darker colors indicate greater fractions) who assigned each rank (1–9, where 1 = most important) to each of the nine potential issue areas. Shown are results for the respondent's perception of (a) the postdoc experience generally, and (b) his/her individual postdoc experience (only individuals who were completing or had completed a postdoc).

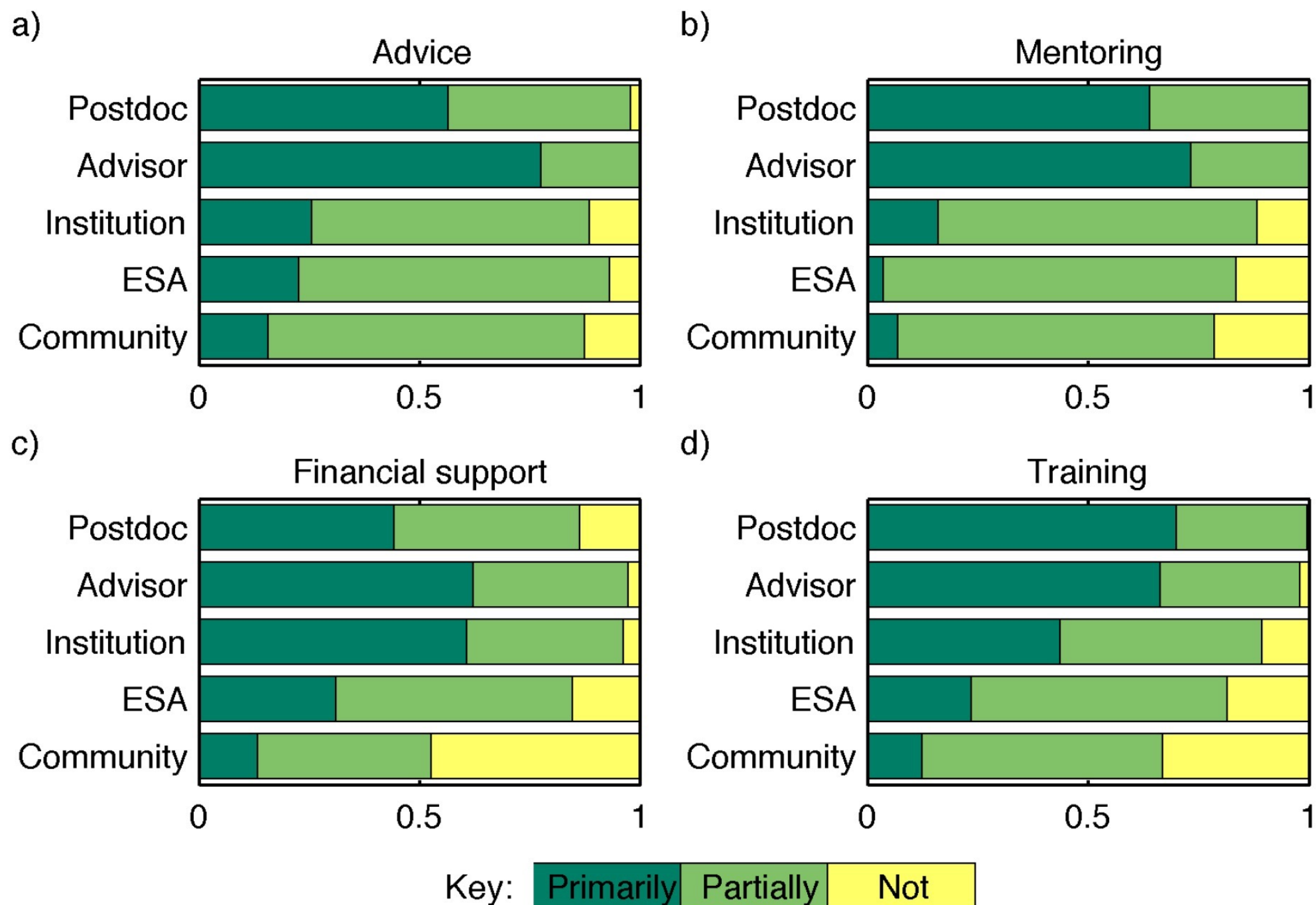


Fig. 2. Fraction of respondents who rated the ideal level of involvement of each of the five entities as primarily, partially, or not involved in addressing concerns related to (a) postdoc career advice and encouragement, (b) postdoc mentoring (both receiving mentoring and experience providing mentoring to others), (c) postdoc non-salary financial support (independent research, travel to conferences, etc.) and (d) postdoc professional training.

MORE TRAINING IS NEEDED  
IN THE *PRACTICE* OF SCIENCE



# VISION AND CHANGE

A CALL TO ACTION

A SUMMARY OF RECOMMENDATIONS  
MADE AT A NATIONAL CONFERENCE ORGANIZED BY THE  
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



“...undergraduates need to understand the process of science, the interdisciplinary nature of the new biology, and how science is closely integrated within society. Students also should be competent in communication and collaboration, as well as have a certain level of quantitative competency, and a basic ability to understand and interpret data...”

–VISION AND CHANGE



# Lack of quantitative training among early-career ecologists: a survey of the problem and potential solutions

Frédéric Barraquand<sup>1,11</sup>, Thomas H.G. Ezard<sup>2,11</sup>, Peter S. Jørgensen<sup>3,11</sup>, Naupaka Zimmerman<sup>4,11</sup>, Scott Chamberlain<sup>5</sup>, Roberto Salguero-Gómez<sup>6,7,11</sup>, Timothy J. Curran<sup>8,11</sup> and Timothée Poisot<sup>9,10,11</sup>

“The overwhelming majority of respondents want more mathematics courses (91%, CI [89.1;92.9]%) and more statistics courses (95%, CI [93.6;96.4]%). Surprisingly, these percentages (90% for more mathematics and 95% more statistics) do not vary much across categories...”



“Given the nature of the field, and despite the outsourcing of modeling to specialists, it is good to at least understand what is going on within the model or behind the model, if not directly programming it yourself. This deeper understanding allows for better theory. It has taken me months of just focusing on statistics/mathematics and models to just get up to speed with fundamentals that I wish had been given during undergrad.”

–SURVEY RESPONDENT

More than 90% of scientists who program are self-taught.

HANNAY ET AL. 2009



SCIENCE NEEDS TO BE  
MORE INCLUSIVE

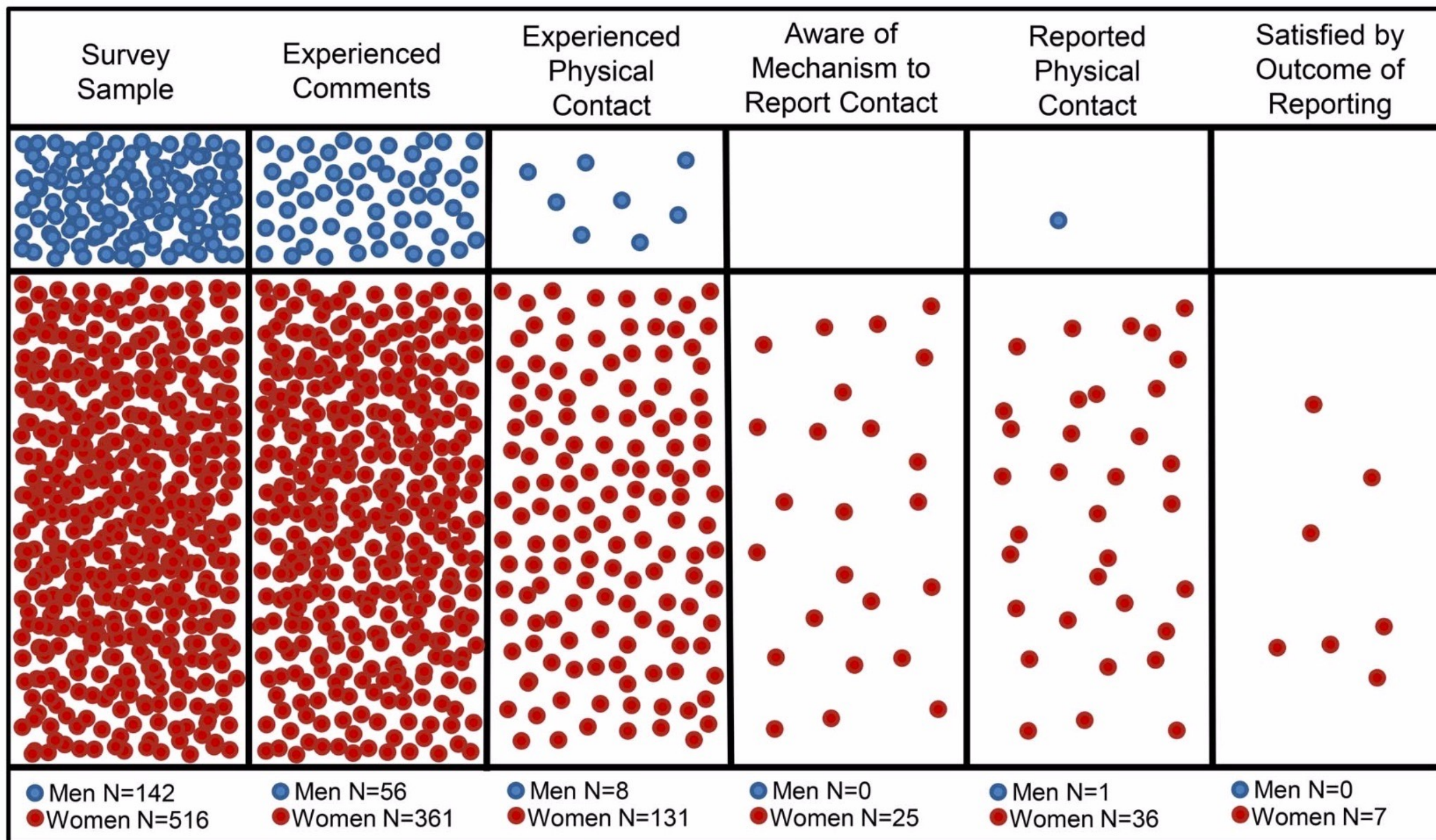


# Survey of Academic Field Experiences (SAFE): Trainees Report Harassment and Assault



**Kathryn B. H. Clancy<sup>1\*</sup>, Robin G. Nelson<sup>2</sup>, Julianne N. Rutherford<sup>3</sup>, Katie Hinde<sup>4</sup>**

**1** University of Illinois, Urbana-Champaign, Department of Anthropology, Urbana, Illinois, United States of America, **2** Skidmore College, Department of Anthropology, Saratoga Springs, New York, United States of America, **3** University of Illinois, Chicago, Department of Women, Children, and Family Health Science, Chicago, Illinois, United States of America, **4** Harvard University, Department of Human Evolutionary Biology, Cambridge, Massachusetts, United States of America



**Figure 3. Visual representation of respondents to the survey, their experiences, and who were aware of, made use of, and were satisfied by mechanisms to report unwanted physical contact.** Each circle represents one survey respondent. Area for men and women is representative of their relative proportion of survey respondents. Eight respondents declined to provide a dichotomous gender designation and are not represented on this graph.

doi:10.1371/journal.pone.0102172.g003



# International Survey of Harassment during Ecological Meetings

Status	Prop. that have experienced	Prop. that have witnessed
Non academic	0.29	0.45
Other	0.27	0.45
Tenured faculty	0.27	0.50
Non-tenure-track faculty	0.25	0.43
Post-doc	0.25	0.29
Graduate student	0.22	0.36
Tenure-track faculty	0.12	0.31
Undergraduate student	0.00	0.23

data from an international survey conducted by INNGE (n = 396)  
led by Tim Poisot

“It’s a big risk for a graduate student to stand up to someone who has such clout in the field. In my case, the professor who tried to take me back to his room is now the chair of my division in my professional society. I now try to avoid him at all costs, but I don't want rumors spread about me or anyone to speculate about what happened. You know, I didn't realize how sad this was until I just started writing about it. Something really has to change...”

—SURVEY RESPONDENT



HOW DO WE MOVE  
FORWARD?



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## Ecology For The New Generation

[Ecology for the New Generation Committee Recommendations May 2012 \[PDF\]](#)



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## Ecology For The New Generation

[Ecology for the New Generation Committee Recommendations May 2012 \[PDF\]](#)

### ESA Code Of Ethics

[As Amended May 2013](#)

7. Ecologists will, to the extent practicable, engage meaningfully with the communities in which they practice to promote teaching, learning and an understanding of their study; broaden the participation of underrepresented groups; enhance local infrastructure for research and education; and disseminate results broadly to benefit the local community.



## RECOMMENDATIONS FELL INTO FOUR MAIN AREAS

- New ways to engage
- Training in new skills and careers
- Action Ecology,  
Translational Ecology,  
Environmental Justice
- International networks  
and connections

Full set of recommendations:  
[http://www.esa.org/esa/documents/  
2013/06/ecology-for-a-new-generation-  
recommendations.pdf](http://www.esa.org/esa/documents/2013/06/ecology-for-a-new-generation-recommendations.pdf)





A SPECIAL REPORT

# *Scholarship Reconsidered*

PRIORITIES OF THE PROFESSORiate

ERNEST L. BOYER

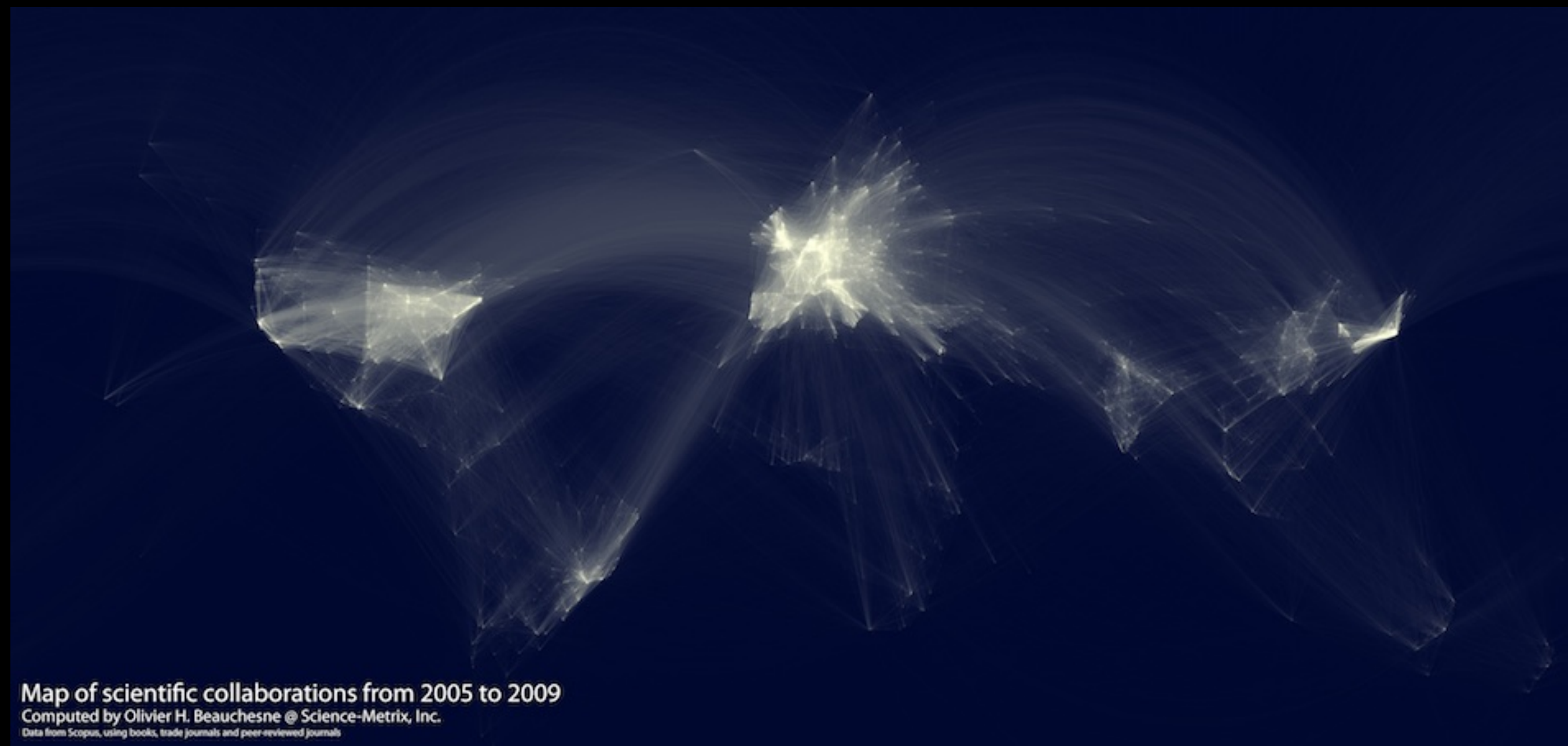


THE CARNEGIE FOUNDATION  
FOR THE ADVANCEMENT OF TEACHING

1990

# BOYER'S MODEL OF SCHOLARSHIP INCLUDES FOUR CATEGORIES

- The Scholarship of Discovery
- The Scholarship of Integration
- The Scholarship of Application
- The Scholarship of Teaching





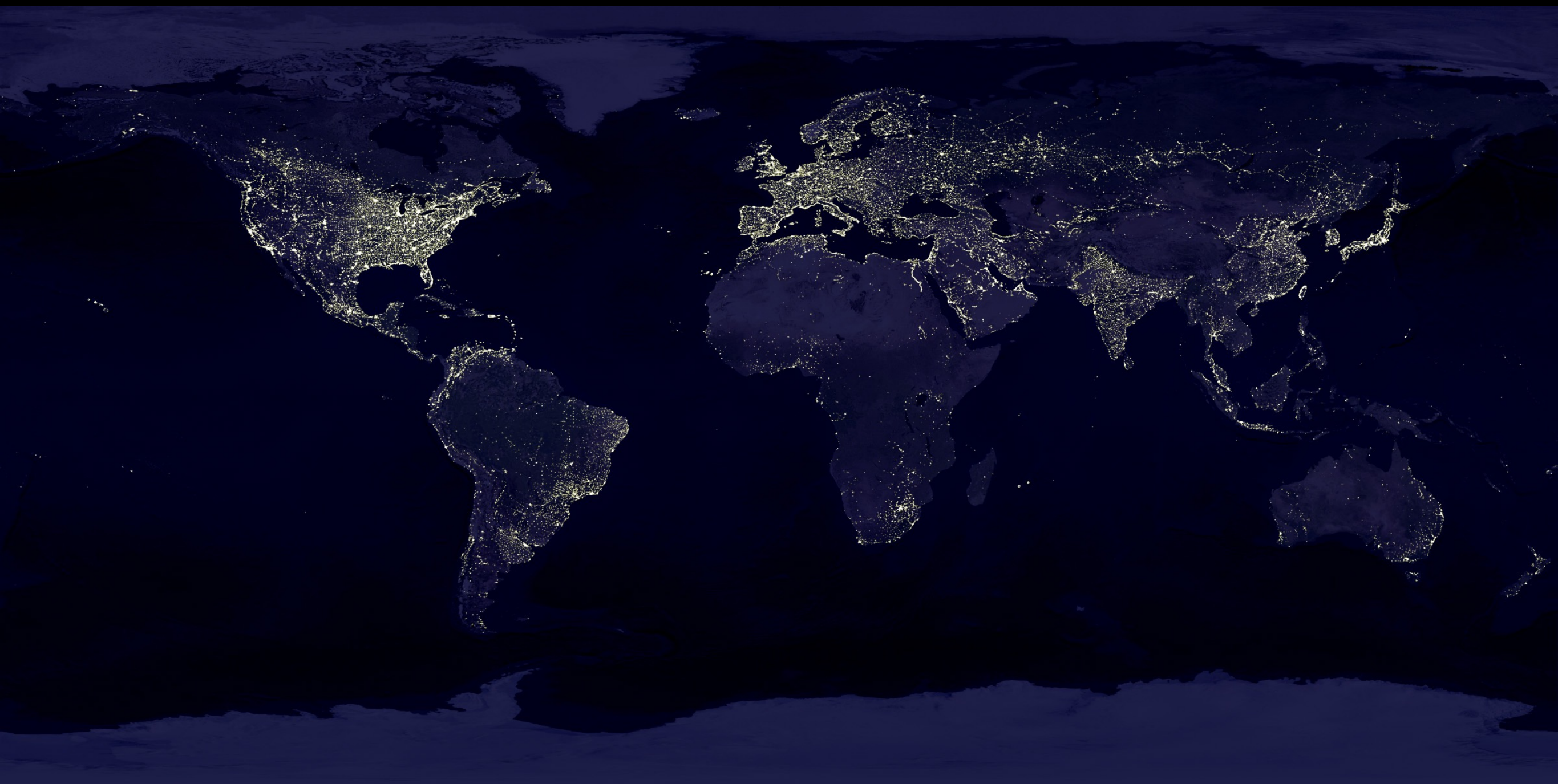
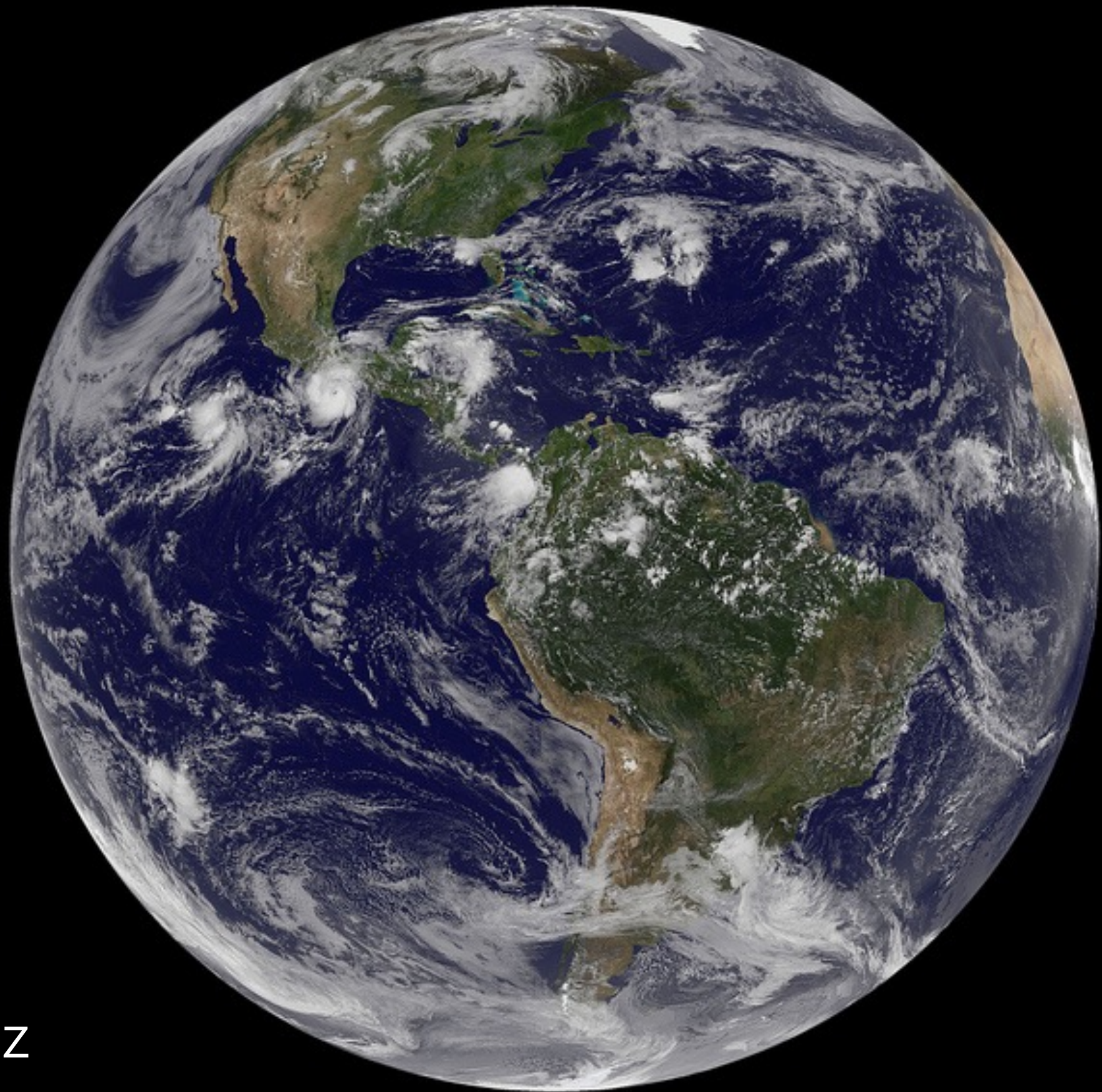


Image by NASA (CC-BY)





@naupakaz

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