

Exploring Avenues to Prepare STEM Practitioners for Global Impact in Research & Industry

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ACS in a Global Context

- ACS is the world's largest individual science organization
 - Over 24,000 members outside the U.S.
- Chartered by the U.S. Congress to advance the field of chemistry and related science
 - Provide access to top peer-reviewed journals
 - Provide access to multiple scientific databases
 - Scientific conferences
 - Public education, advocacy, support the field broadly*
- Unique in that our charter *mandates* global involvement
 - Mission: *Advancing the broader chemistry enterprise for and its practitioners for the benefit of Earth and its people*

Global Challenges in STEM Curriculum



- The chemistry community has long prepared its trainees for careers in basic research
 - However, 51% of ACS members work in industry, thus creating a huge gap
- Some difficulty in convincing US-based PI's on value of sending trainee abroad for short or long-term study
 - Prevailing culture of questioning value
 - [Simply follow the data](#)
- Curriculum restrictions create hurdles for STEM students to engage globally (i.e. semester long studies not practical)
 - Gave rise to funding of IREU Programs (still rather elusive)
 - Relatively few electives allowed in strict STEM programming

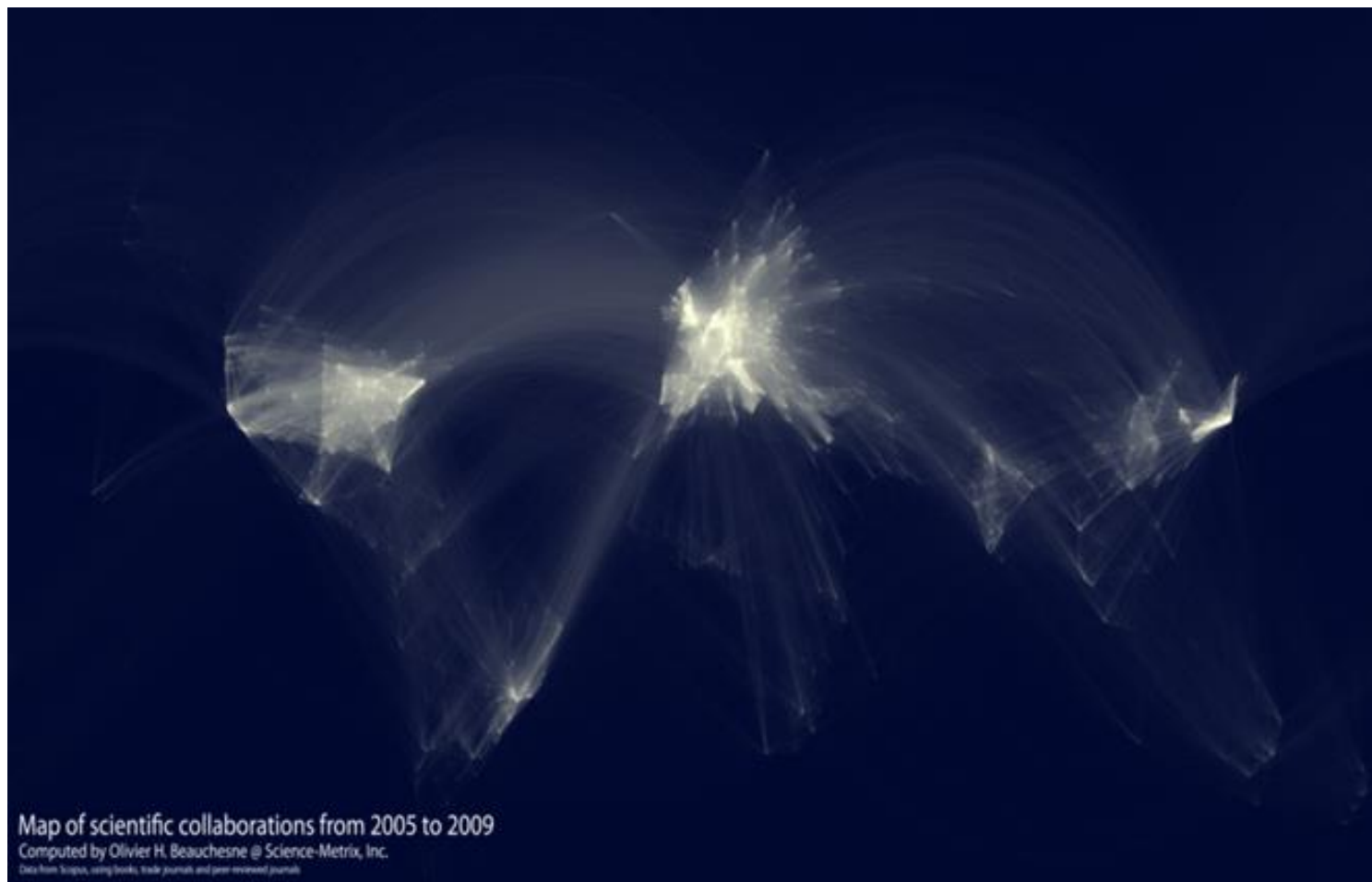
Adding Industry Perspective

- U.S. based institutions fall behind in promoting industrial ties
 - European funders often require ties with industry
- Impact on long-term global competencies?
 - In the research lab:
 - Exposure to culture through hosting scholars
 - BUT, research is generally guided on your own-team mentality is less ardent
 - Global collaboration is key, but *first author* stress
 - In the industry lab:
 - You interact with your colleagues in a *cross-functional* manner
 - Stronger interpersonal skills
 - One part of the puzzle/solution-less focus on research prestige
- ACS Industry Member Programs working in enhanced training

ACS Global STEM Outreach

- ACS has long been committed to promoting global collaboration in research and training
 - 2005 Open Doors Report: 16%
 - 2016 Open Doors Report: 24%
- Scientists are beginning to catch on to what business and humanities have known all along!
- ACS IREU Program
 - NSF Funded Program for 16 students annually
 - Short-term lab stay, presentation at ACS National Meeting
- [ACS International Center](#)
 - Virtual Hub of resources, funding opportunities for STEM community
 - Events (live and virtual)

Map of Global Scientific Collaborations from 2005-2009



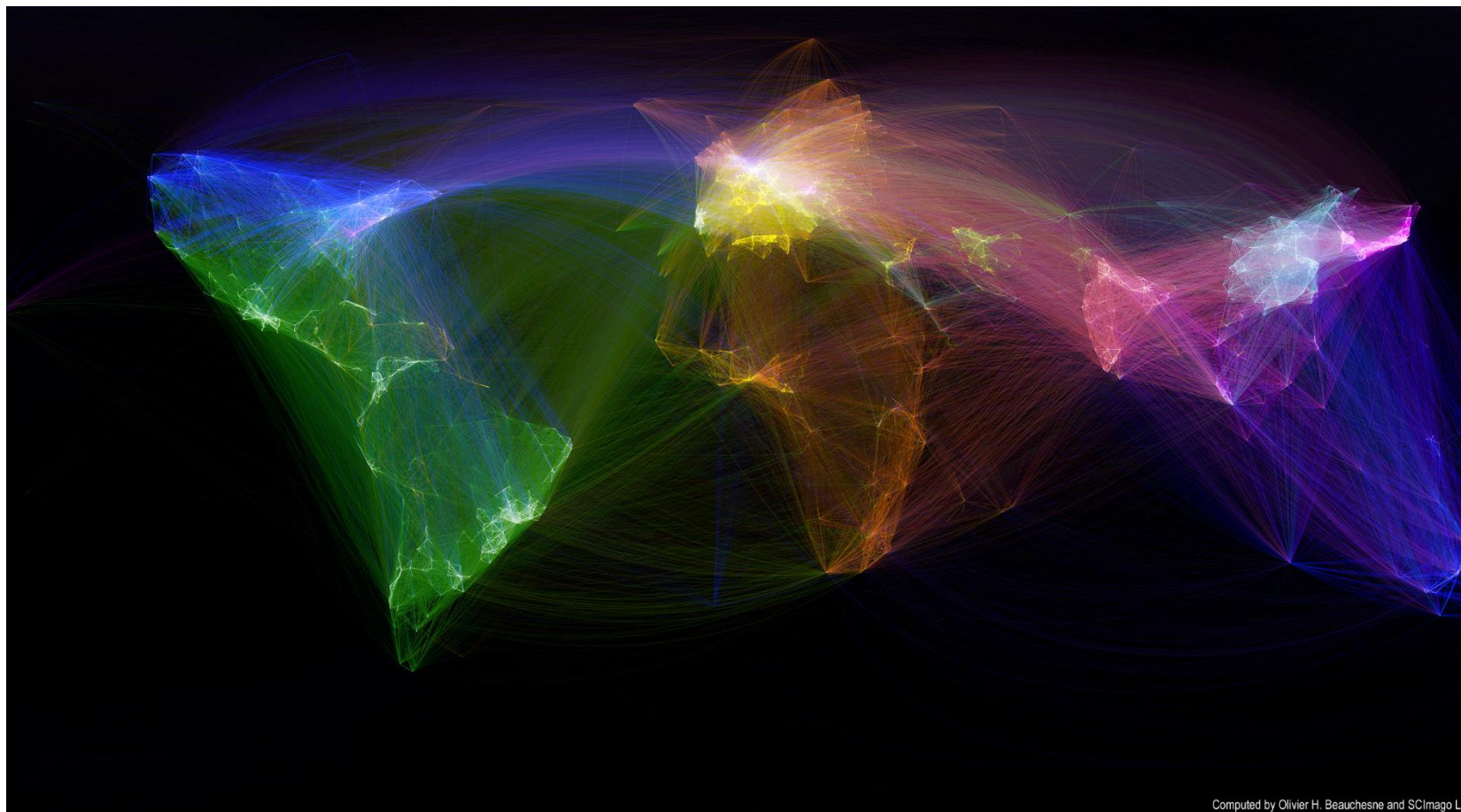
Computed by Olivier H Beauchesne at Science-Metrix, Inc
Data from Scopus using books, trade journals, & peer reviewed journals

Global Impacts of Initiatives ACS & Beyond



- ACS IREU Program leads to global thinking in STEM
 - One of the few organizations to have an iREU
 - Results are trickling in, but:
 - In 2015 alone 2/17 students went on to international grad programs
 - In 2016 program: 1 program accepted in Erasmus Mundus (only American)
 - “This program made global collaboration *attainable*”
- ACS International Center as a hub
 - We want the STEM community to have access
- Four years on:
 - Over 130,000 unique visitors
 - 60/40 ratio in traffic
- New Horizons
 - We’ve made it easier
 - Media for the future

Map of Global Scientific Collaborations 2008-2012



Computed by Olivier H. Beauchesne and SCImago Lab

Computed by Olivier H Beauchesne at MindGeek
Data from Scopus using books, trade journals, & peer reviewed journals

Where do we go from here?

- How can best prepare our STEM students to be pioneers in the future global economy?
- STEM vs. STEAM
 - What is the future of integration?
 - Role of civil society?
- How can we incorporate broader international training initiatives into the STEM curriculum? How do we make these opportunities more broadly available (i.e. diverse communities?)



ACS

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Thank you!



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