

Diversity at *Goldschmidt* conference

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Over the past seventy years, geochemistry has grown up to become one of the major branches of Earth, Environment and Planetary Science, one that has infiltrated and become part of many other subdisciplines. Without geochemistry, we would know very little about the age and evolution of our planet, its crust, mantle and core, and we would have little understanding of our environment, the atmosphere and the oceans. But if one asks a geochemist what her/his subject area/discipline is, then their answer is likely to be “geologist,” or “oceanographer,” or “climate scientist” instead of “geochemist.” Ask the same question to a geophysicist, and the answer will surely be “geophysicist”. Somehow, our field seems to be in a permanent identity crisis (**Figure 1**).

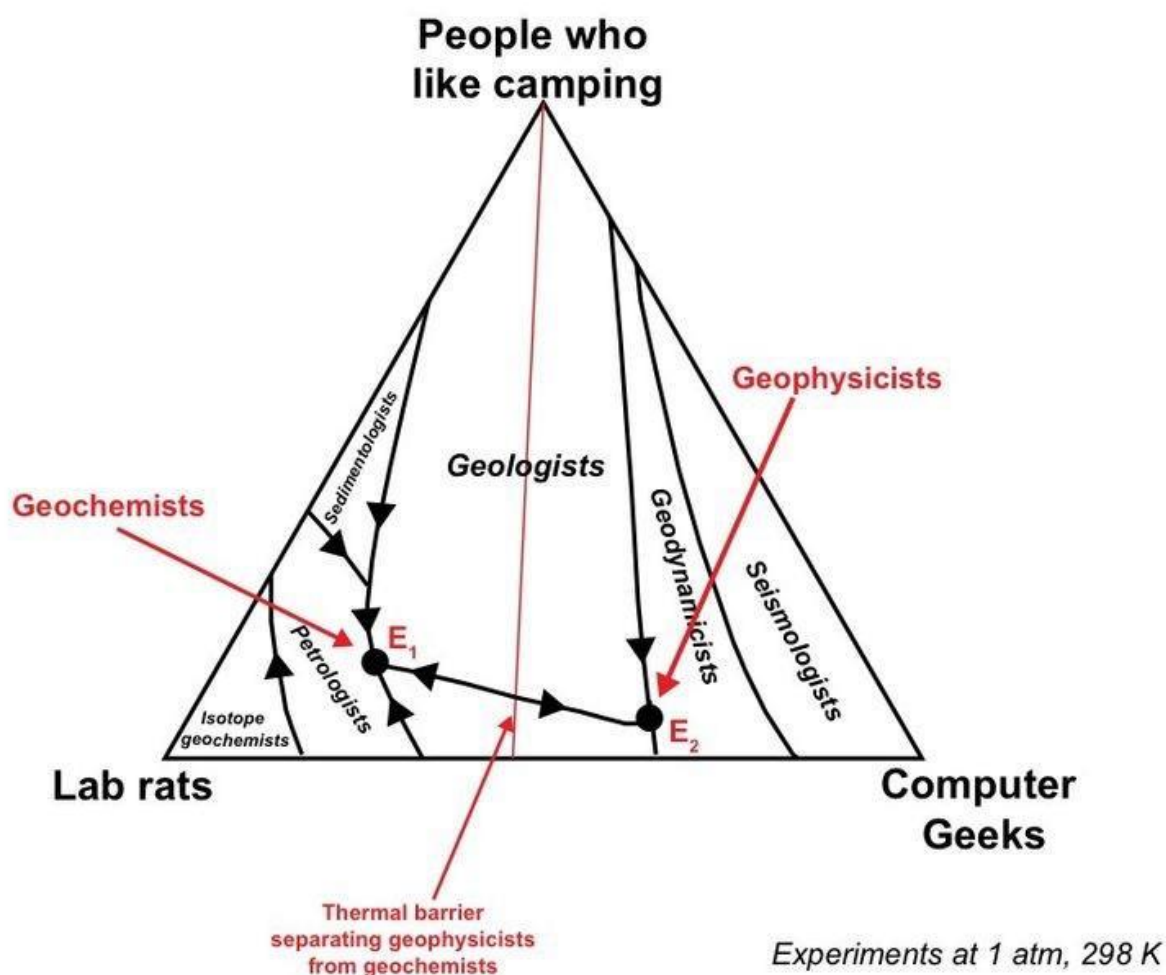


Figure 1 Sketch from Emily J Chin. <https://doi.org/10.6084/m9.figshare.14426774.v1>

Why do not more of us identify more closely with our own main professional expertise?

When geochemistry came of age, all the historical fields, paleontology, mineralogy, geology, and geophysics had already been organized in professional societies. The situation is the same everywhere in the World. Some country based societies (e.g., The German Mineralogical Society) alone have more members than either [European Association of Geochemistry](#) (EAG, founded in 1985) or even [Geochemical Society](#) (GS, founded in 1955). It's good because of the pervasiveness of geochemistry, its integration with other fields, and the new life it brings to older disciplines such as petrology or stratigraphy. At the same time, new areas such as environmental geochemistry also emerge. Therefore, it was unsurprising

to find in one UK based geochemistry community survey study that the majority of geochemists contribute to more than one research area (Anand et al., 2024, doi.org/10.3389/esss.2024.10098). It is bad for geochemists because it keeps us from gaining the recognition we should have earned by our scientific contribution in the eyes of the outside world.

This is where the Goldschmidt Conference comes in. The Goldschmidt Conference was inaugurated in 1988 and has become a large international meeting. The Goldschmidt Conference is the main annual international conference on geochemistry and research areas/disciplines where geochemistry is applied, organized by the EAG and the GS. This international event has become a scientifically rewarding, successful, and increasingly visible point of professional identification and intercourse exclusively devoted to and clearly identified with Geochemistry. Finally, a space for geochemists to come together and share their enthusiasm for complicated laboratory methods and novel proxy development, shared sense of belonging to talk about instruments (up/down) times, planetary-scale insights revealed from the slightest variability in isotope ratios, and the newfound scientific potential of even the most obscure pockets of the periodic table without losing their audience at the first elemental abbreviation and much more. Goldschmidt conferences take place in North America (or other parts of the World, e.g. Japan, Australia) in odd years and in Europe in even years (Figure 2) and have seen a globally growing audience.

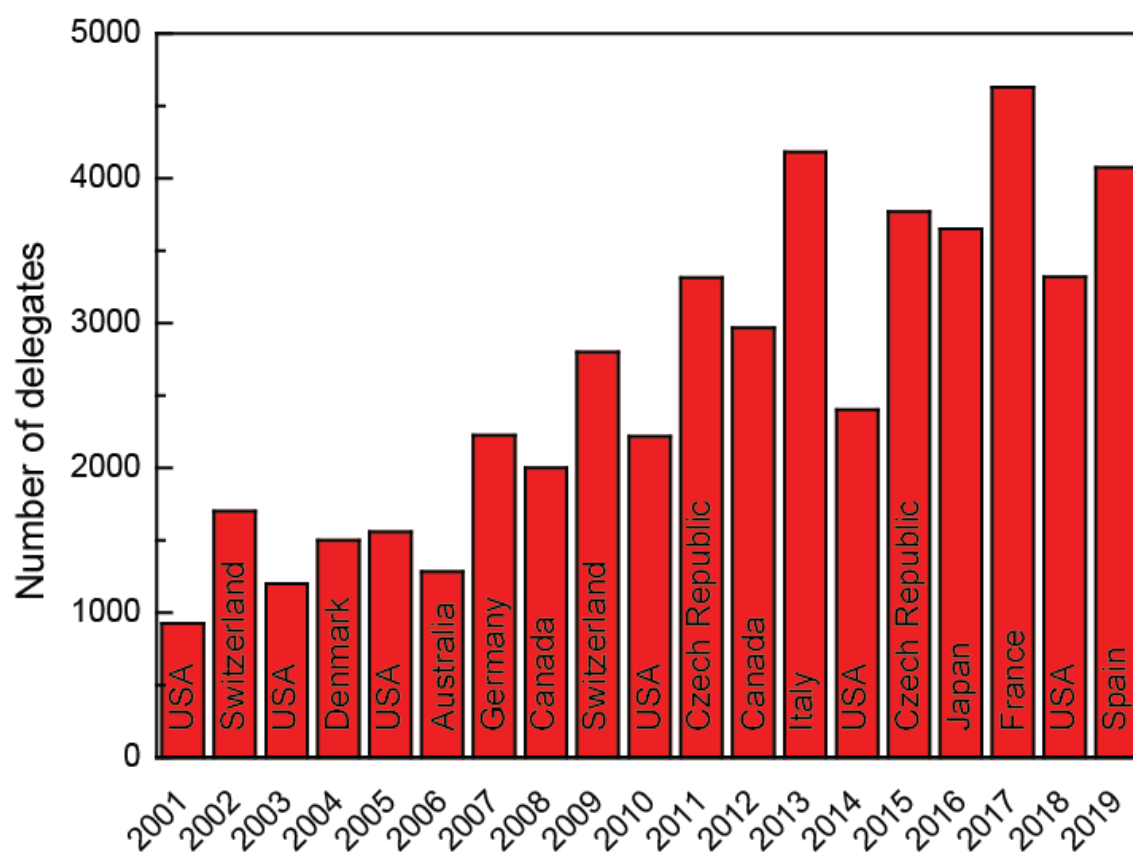


Figure 2 Evolution of the number of delegates since 2001. Country of the conference location is depicted in each bar.

Historically, however, the experience and rewards of attending the Goldschmidt conference have not been equitably distributed throughout the global geochemistry community.

- Some developed nations in North America and Western Europe make up the bulk of conference attendees (**Figure 3**);
- Men are overrepresented (~60% in 2018 and 2019) compared to other groups (**Figure 4**);
- Students are underrepresented (25% to 32%). However, the recent emergence of virtual attendance and funding support has allowed more students to participate (40%) (**Figure 4**).

Thereby holding hybrid conferences lends support for wider representation, depending on the conference location. For some locations, those from the LGBTQ+ community may not feel comfortable attending the conference in person, see discussion:<https://journals.asm.org/doi/10.1128/msystems.00433-23>. Those excluded from the conference lose exposure, collaboration, and networking opportunities.

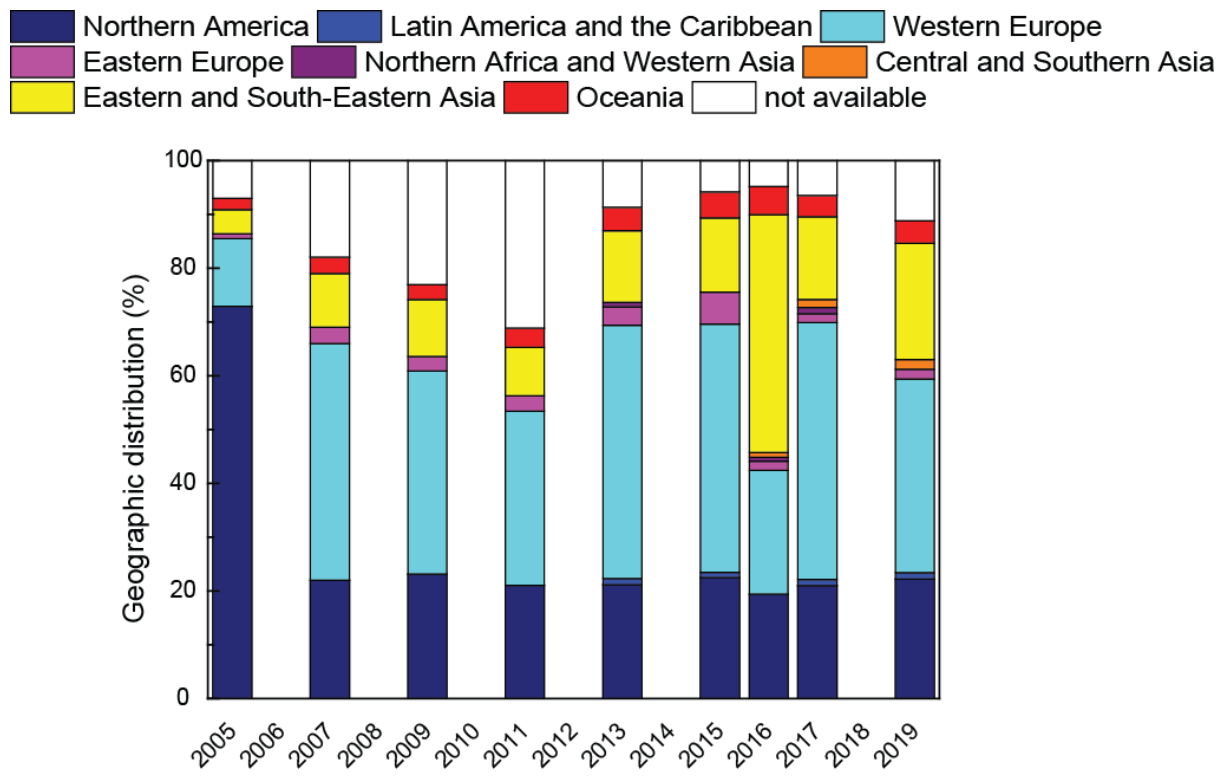


Figure 3 Geographic distribution of delegates' affiliations (regional grouping based on Sustainable Development Goals indicators).

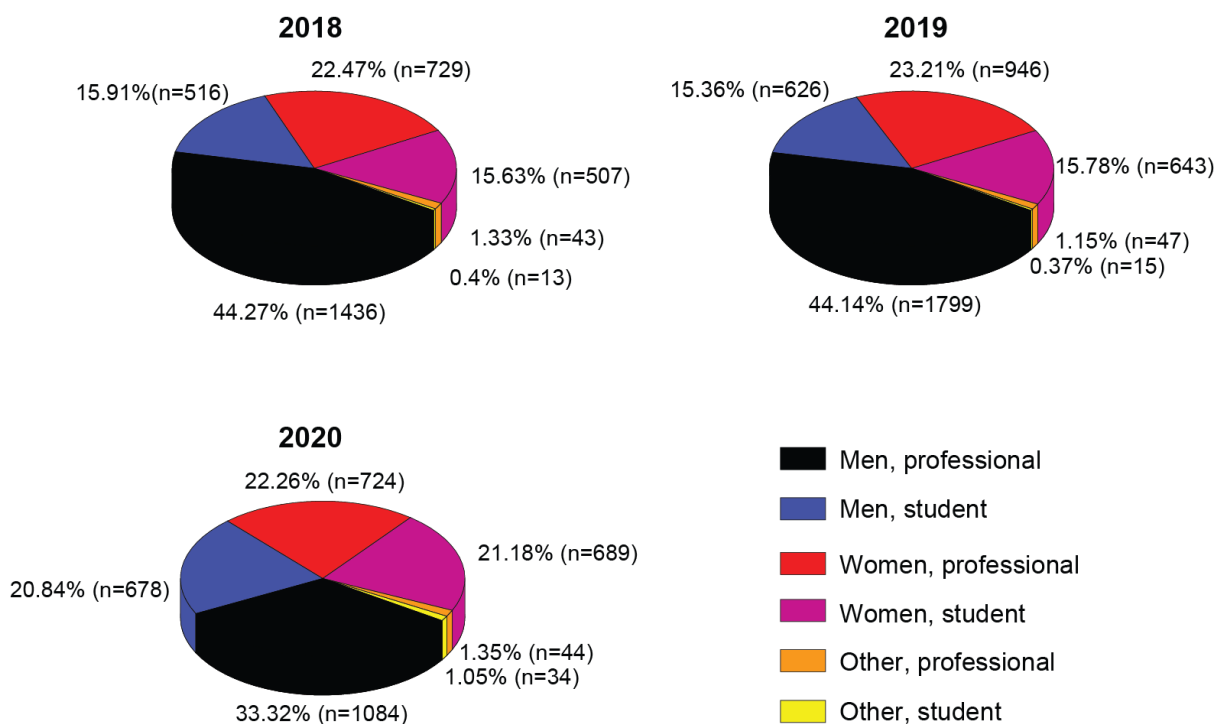


Figure 4 Gender and career stage distribution of Goldschmidt Conference attendees between 2018 and 2020

(<https://www.sciencedirect.com/science/article/pii/S0016703721003355>).

About four years ago, the GS and EAG began discussions on how to make the Goldschmidt Conference a more inclusive conference for everyone who attends. The GS Ethics Committee led the effort to write a code of conduct. To support implementation of this code, the societies trained a group of volunteers to serve as points of contact for any delegate who had questions or experienced harassment during the conference. This initiative was named AMIGo (A More Inclusive Goldschmidt). The Local Organizing Committee also made diversity and inclusion a focus of the conference, and in 2021 special EDI sessions started featuring at Goldschmidt. Furthermore, since year 2022 Wednesday's plenary was devoted to diversity, and a workshop was included to address the issue of sexual harassment in the workplace (Goldschmidt 2022). Additionally, enabling events/workshops (such as Pride Event and 'Hidden Histories' Workshops) to celebrate diversity of our community are key signs of positive action taken by the Goldschmidt organizing committee in recent years. Celebrating people and their diverse identities with science that breaks

perceived/unperceived barriers and welcomes a community that underpins diverse research areas.

Along with these great efforts in promoting positive actions, it is important to be cognisant that there are places that are known to have LGBTQ+ and/or racist issues, and to avoid conference venues in those regions (<https://baas.aas.org/pub/2021n4i442/release/1>). To continue with the success of Goldschmidt in bringing people and science together, lessons from the past has to be learned and ensure that the conference host regions are free from any LGBTQ+ rights issues, any racist policing practices, any restrictive abortion issues (APS: <https://baas.aas.org/pub/2021n4i442/release/1>; EGU: <https://blogs.egu.eu/divisions/gmpv/2020/09/09/the-challenges-of-being-lgbtqia-in-earth-sciences/>; <https://www.science.org/content/article/how-scientific-conferences-are-responding-abortion-bans-and-anti-lgbtq-laws>). To further enhance the continued effort, Goldschmidt venues could be set up with gender neutral bathroom options within its host conference center (if they are not already available). Some societies and event organizers are rethinking their alcohol policies in a bid to be more inclusive (<https://www.nature.com/articles/d41586-021-03773-z>) but two-thirds of scientists want to keep alcohol at conferences <https://www.nature.com/articles/d41586-022-00703-5>, alcohol creates a relaxed, social atmosphere at conferences, say survey respondents, but more care could be taken in having places/areas that are alcohol free to ensure everyone feels safe and included.

It is worth noting that the Goldschmidt is a relatively expensive conference compared to other annual meetings in Earth Sciences (**Table 1**). It is understandable that Goldschmidt is expensive due to its relatively smaller attendees size in comparison to others in Table 1. However, higher registration fees, and the cost of travel to conference locations that are primarily based in North America and Europe, could be a barrier to participation for many students and scholars from lower income countries. In addition, VISA requirements for

delegates wishing to attend the conference in US locations (for example) have become increasingly stringent, adding an extra barrier for attendance for some.

A good way forward would be to try to make it less expensive through remote attendance (like the hybrid formats in 2020, 2021 and 2022). It must be noted that the current Goldschmidt procedure allows remote registration fees to be completely waived for attendees from low-income and lower-middle-income countries as well as for students. While this approach can be more inclusive and accessible, we do worry that this may potentially set up a two-tiered Goldschmidt experience - where scientists with funding can come and enjoy the in person experience while others are left to experience remotely. There is a precedent for making hybrid conferences more inclusive but this has been done for smaller meetings (e.g. EGU Galileo conference 2022 on Pliocene climate) where organizers made extra effort to include remote participants' voices during the meeting.

Eventually, it could be helpful for a future Goldschmidt meeting to be held outside of the Global North (for example, in Latin America, Africa, Southeast Asia, etc.). Moving the conference location away from North America and Europe makes the cost of attending much lower for those not from North America/Europe and increases the travel distance required for regular conference attendees while allowing new participants to the conference.. It is inevitable that this would be detrimental to environmental sustainability and therefore an individual choice is to be made to reach a balance between social and environmental responsibility.

Table 1 Conference registration fees for students and members for attending annual meetings in Geosciences (data from conferences websites).

Year	Goldschmidt		EGU		AGU	
	Student member (non-member)	Regular member (non-member)	Student member (non-member)	Regular member (non-member)	Student member (non-member)	Regular member (non-member)
2017	€295 (€345)	€490 (€540)	€220 (€245)	€ 385 (€430)	300\$ (400\$)	600\$ (800\$)
2018	350\$ (410\$)	595\$ (655\$)	€225 (€345)	€390 (€530)	350\$	500\$ (600\$)
2019	€330 (€390)	€545 (€605)	€260 (€345)	€420 (€565)	290\$ (330\$)	540\$ (700\$)
*2020	25\$ (95\$)	100\$ (170\$)	€245 (€365)	€410 (€550)	100\$ (150\$)	249\$ (350\$)
2021 online only (COVID-19)	€75 (€135)	€200 (€260)	€75 (€90)	€150 (€180)	295\$ (365\$) 230\$ (275\$)	585\$ (775\$) 440\$ (585\$)
2022	375\$ (450\$)	650\$ (725\$)	€95 (€115)	€ 190 (€235)	300\$ (415\$)	600\$ (800\$)
2023	€325 (€385)	€540 (€600)	€290 (€440)	€500 (€680)	365\$ (485\$)	725\$ (905\$)
2024	490\$ (565\$)	790\$ (865\$)	€345 (€505)	€565 (€765)	tba	tba

tba to be announced. *in 2020, due to COVID pandemic, conferences were online.

Overall, the Goldschmidt conference aims at being an inclusive conference by statement and involvement of EAG and GS DEI committees members. As professional societies, GS and EAG are committed to providing an environment that encourages the free expression and exchange of scientific ideas. In pursuit of this, GS and EAG-sponsored meetings and events foster the exchange of scientific ideas, through open and respectful dialogues at oral and poster sessions, field trips, short courses, mentorships and other society-supported programs. The societies are committed to the philosophy of equality of opportunity and treatment for all members, regardless of age, gender, gender identity or expression, sexual orientation, race, color, ethnicity, country of origin, religion or religious belief, marital status, physical appearance, body size, disability, or any other reason not related to scientific merit.

It is the responsibility of the organizers of any GS and EAG meeting, and of the attendees themselves, to ensure that such an atmosphere is maintained. The GS and EAG consider the rich diversity of the societies' memberships and of the wider geochemical community a resource that should be drawn upon when selecting organizing committees, invited speakers, and nominees for office and for awards. The AMIGo (i.e. A More Inclusive Goldschmidt) initiative is a good illustration of that philosophy. However, a lot more is to be done to build an inclusive community and be true to our statement of embracing diversity in all of societies' workings such that we serve the community.