

Ten years after: a survey among participants of Masterclasses

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based on [arXiv:2307.15906](https://arxiv.org/abs/2307.15906)

Motivation: What is the impact after 19 years of running IMC?

- What is the impact within HEP community?
- What is the impact within the broad society?

Problem: To do a survey, how to identify former participants of International Masterclasses?

Example: Slovakia (all institutions participating in IMC) and Czech Republic (one institution)

Survey 1: former participants to IMC (fans)

Original surveys conducted in 2011-2015

- questionnaires after the IMC events
- collected at all participating institutions in Slovakia and one in Czech Republic
- questionnaires by default anonymous, but with **voluntary entry of the email address**
- Goals of the original surveys
 - motivation to participate
 - career plans
 - evaluation of the event
 - suggestions for improvement of the IMC
- about 1000 respondents in total

New survey: google form requested from former participants with known emails (spring 2023)

- 484 email addresses collected from archived questionnaires
- 133 messages returned as undeliverable, assume 351 messages delivered
- **71 completed online google form**
- 36 voluntarily provided email address (otherwise anonymous)

Survey 2: young professionals in HEP (practitioners)

- anonymous google form
- we asked senior faculty members and group leaders at all HEP institutions in Slovakia and Czech Republic, to forward our request to young colleagues
- respondents: from master level students up to ca 35 years of age (do HEP and could have participated in IMC)
- 19 responses collected
- (total group of young researchers: ca 100 in CZ and 25 in SK)

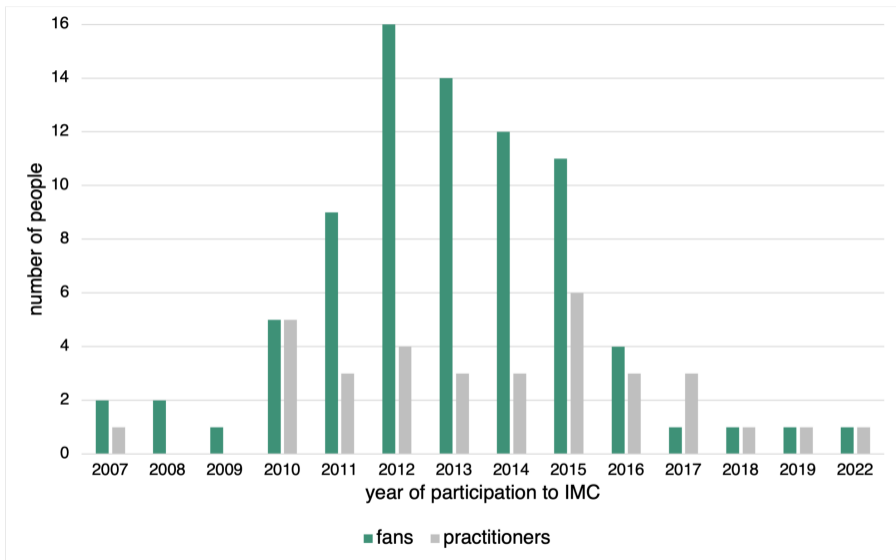
Questions in Survey 1 (fans)

	Question	Mode of answer
Q1.1	In which year have you participated in Masterclasses?	multiple choice
Q1.2	At which place have you participated in Masterclasses?	multiple choice
Q1.3	I came to Masterclasses with the ambition to study particle or nuclear physics.	5-point Likert scale
Q1.4	Masterclasses have influenced my decision to study physics or related subject.	5-point Likert scale
Q1.5	I contribute to the development of science—I am scientific associate, or I work for a company focussed on R&D, or I want to work in this field after I finish my study.	5-point Likert scale
Q1.6	The content of my current employment or study is:	short free text
Q1.7	Thanks to Masterclasses I positively changed my opinion about science, research, and physics.	free text
Q1.8	I am interested in the news from CERN and/or news from science and particle physics.	5-point Likert scale
Q1.9	If you want to leave us a message, you can type it here.	long free text
Q1.10	This is the end of the questionnaire. If you agree with the comparison of your answers with the answers that you gave after the event, leave us your email address here. Thank you!	short free text

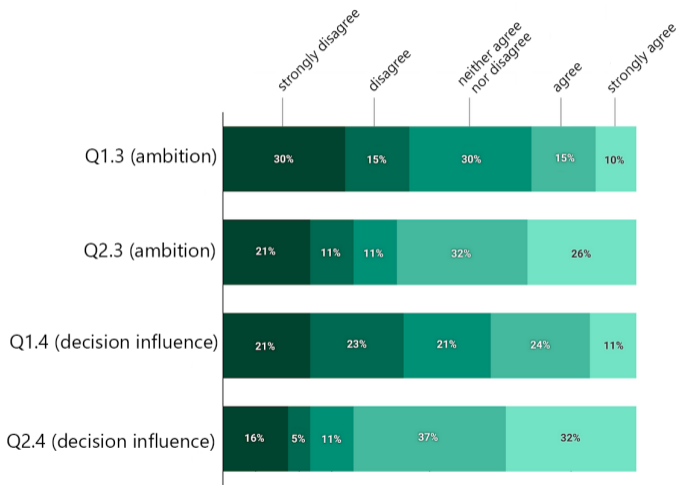
Questions in Survey 2 (practitioners)

	Question	Mode of answer
Q2.1	In which year have you participated in Masterclasses?	multiple choice
Q2.2	At which place have you participated in Masterclasses?	multiple choice
Q2.3	I came to Masterclasses with the ambition to study particle or nuclear physics.	5-point Likert scale
Q2.4	Masterclasses have influenced my decision to study particle physics	5-point Likert scale
Q2.5	Later I have helped with the organisation of the Masterclasses at the institution where I studied or worked.	5-point Likert scale
Q2.6	I would like to help with the organisation of Masterclasses in the future.	5-point Likert scale
Q2.7	In particle or nuclear physics I am rather focussed on...	multiple choice from: experiment; theory; phenomenology; nothing yet, because I study
Q2.8	My current professional status could be described as...	radio buttons: student (bachelor or master level); doctoral student; postdoc; scientific staff; university teacher; other
Q2.9	If you want to leave us with a message concerning Masterclasses, type it here. We will be grateful, e.g., for proposals what can be improved. In any case, thank you for filling the questionnaire.	long free text

Years of participation in IMC in our data sample



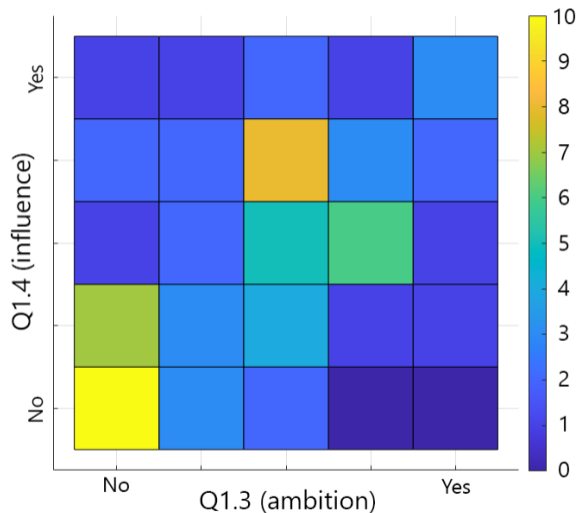
Results: Ambition to do HEP (QX.3), influence of IMC on career (QX.4)



QX.3: I came to IMC with the ambition to study particle or nuclear physics.

QX.4: IMC have influenced my decision to study particle physics

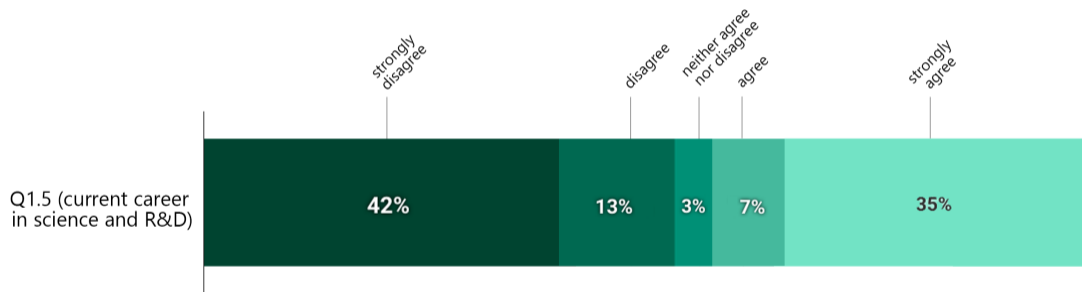
Results: Ambition to do HEP (Q1.3) vs influence of IMC on career (Q1.4)



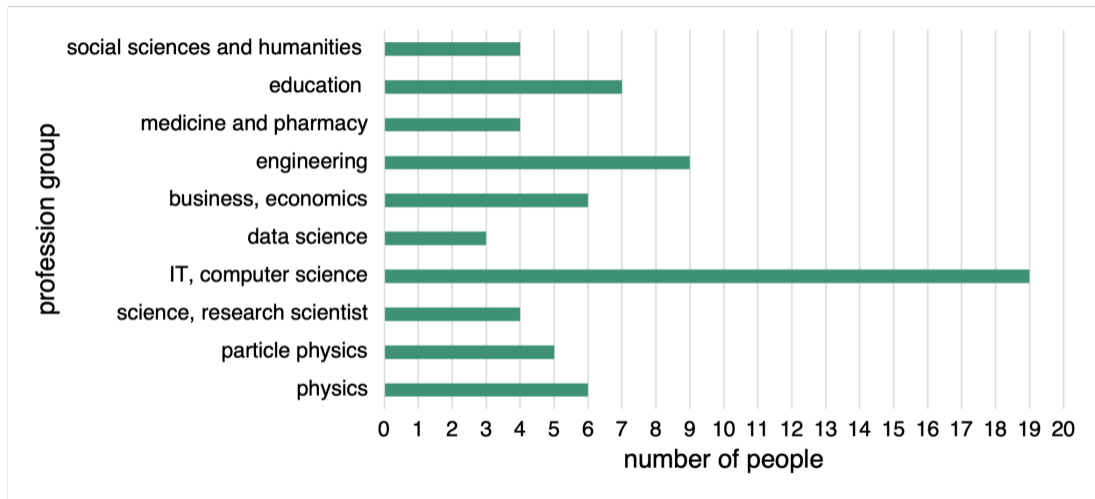
Q1.3: I came to IMC with the ambition to study particle or nuclear physics.

Q1.4: IMC have influenced my decision to study particle physics

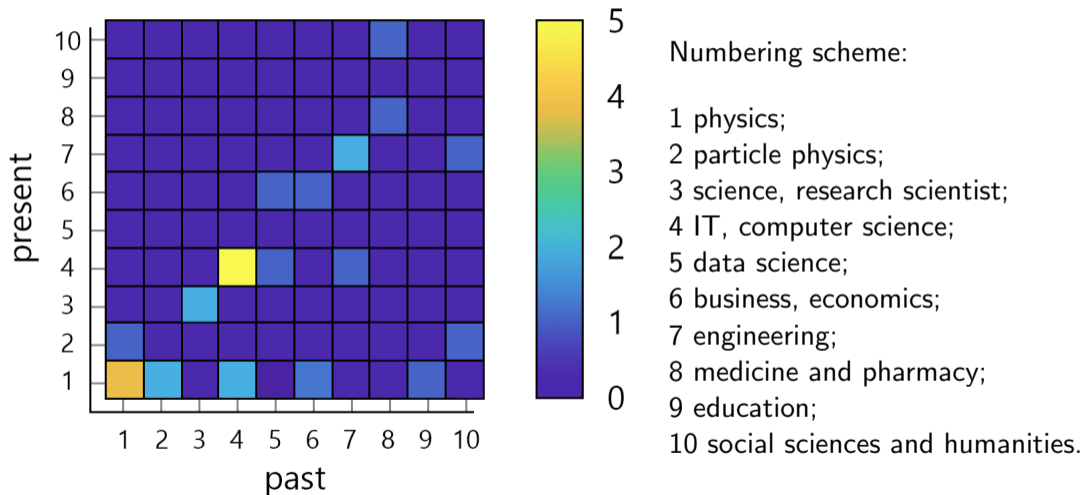
Results: current career in science an R&D



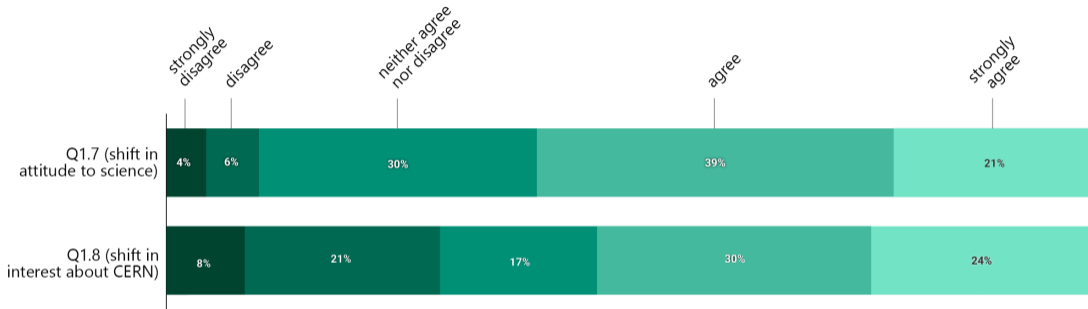
Results: current occupations



Results: career plans after IMC vs. present job



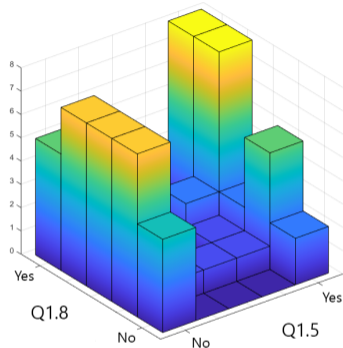
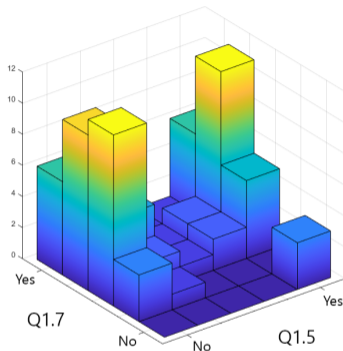
Results: attitude and interest in science



Q1.7: Thanks to Masterclasses I positively changed my opinion about science, research, and physics.

Q1.8: I am interested in the news from CERN and/or news from science and particle physics.

Results: attitude and interest in science vs profession



Q1.5: I contribute to the development of science—I am scientific associate, or I work for a company focussed on R&D, or I want to work in this field after I finish my study.

Q1.7: Thanks to Masterclasses I positively changed my opinion about science, research, and physics.

Q1.8: I am interested in the news from CERN and/or news from science and particle physics.

Ideas from free responses

- As a teacher I would recommend it to pupils interested in physics
- ... It also helped me understand certain things, to grasp some concepts we learned in high school, perhaps because our teachers didn't have the in-depth knowledge to present them simply and logically...
- ... IMC makes sense, even if a person ultimately decides to do and study something other than particle physics. Many projects today are interdisciplinary ...
- It definitely increased my interest in this field at that time, even though later, ... I decided to study computer science
- Even if I did not study physics at last, but informatics, CERN still bugged me and finally I got there as a fellow and spent three years in the IT division. Just by chance, right now I am sitting in a train to Geneva on my way to visit my former colleagues. :)

Conclusions

- IMC exert a positive nudge towards HEP and physics
- IMC provide highly effective learning environment
- IMC disseminate knowledge and culture beyond the realm of particle physics

[Júlia Kekeláková and Boris Tomášik: [arXiv:2307.15906](https://arxiv.org/abs/2307.15906)]