

Czech neutron user community – basic information

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Size of the national community, how counted / assumed?

The Czech neutron user community is not yet organized as a standalone association with a clearly defined membership. Estimates of the community size thus rely on indirect resources:

- There are 143 subscribers to the Czech neutron mailing list – the main tool for communication within the community.
- Recent analysis of the Scopus search for “neutron publications” ⁽¹⁾ shows annually about 120 unique authors affiliated with Czech institutions.
- The user statistics of ILL includes 159 unique Czech users since 1999.
- The number of scientists participating in the community meetings is consistent with the above numbers. The last CZ neutron community meeting (Prague, 1st February 2024, <https://meeting.neutrons.cz/>) had 73 registered participants.

Although these proxy values obviously assume somewhat different definitions of “who is a neutron user”, they all seem to confirm earlier estimates of *over 100 neutron users* in Czechia.

Is there any national association? In case yes, how is it organized?

At present, the Czech neutron community is represented as a part of the *Czech and Slovak Crystallographic Association (CSCA)*. The program of CSCA covers many research areas related to the structural research of materials using X-rays and neutrons, providing thus a suitable platform for community activities including organization of seminars, schools and conferences on a national and international level. Nevertheless, foundation of a separate neutron user association has been considered and some preparatory steps in this direction have already been taken. The motivation for such a move is driven mainly by the need of a platform for activities and communications specific to the neutron community, such as support of access programs, participation in neutron-related EU projects or engagement of the community in the early science at ESS. The Czech neutron community needs its own identity particularly for maintaining current memberships and initializing new collaborations with neutron large-scale facilities.

What are the scientific fields your members are active in? - Are there scientific highlights (especially for the smaller communities)?

Both publication outputs and variety of institutions where the community members come from illustrate that the spectrum of research fields covered is very broad. Figure 1 shows that about 2/3 of CZ authors of neutron publications is affiliated with just 3 institutions: The Faculty of Mathematics and Physics (MFF UK), the Institute of Physics (FZU AVCR), and the Nuclear Physics Institute (UJF AVCR). But the remaining 1/3 come from further 28 institutions from very diverse areas of research.

¹ The search is independent of the AI-aided analysis published in the ENSA paper, but there is about 86% overlap of both databases as regards the relevant CZ neutron publications for 1994-2023.

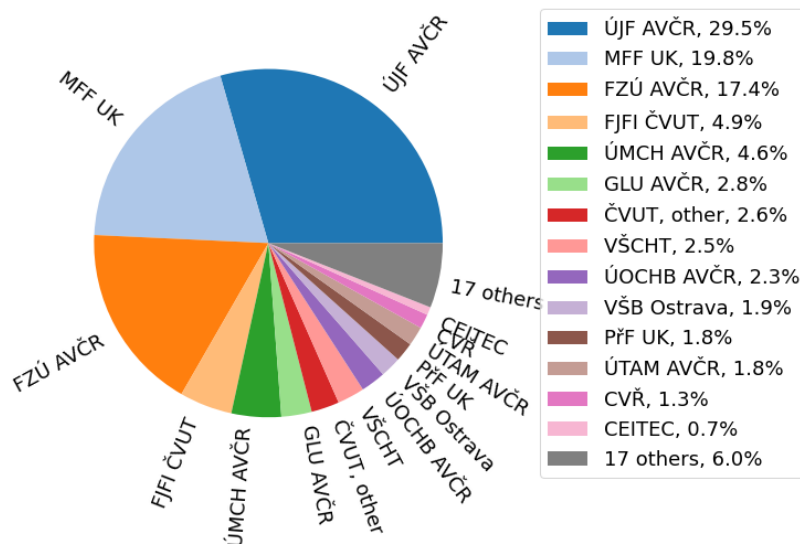


Figure 1. Affiliations of co-authors of “neutron publications” with various institutions in Czechia, average for 2014-2023. Only authors with at least 3 neutron publications over the last 30 years are considered.

The distribution of CZ proposals to ILL according to ILL colleges (Figure 2) also shows the diversity of research areas. The Czech community has been traditionally very active in research directions such as crystal structure, magnetic structure and lattice and magnetic excitations. At present, also other disciplines are tackled by several groups, highlighting large-scale structures, biology and chemistry.

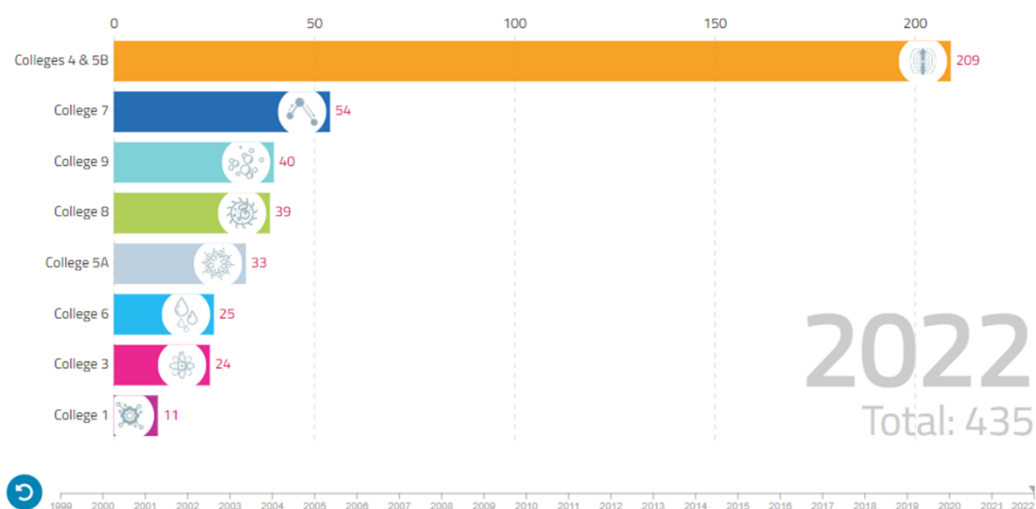


Figure 2. ILL – disciplines distribution of Czech experiments (number of proposals since 1999).

In case you have a (even older) national strategy, please attach. - If not, but there are ongoing discussions (e.g. about CANS, ILL/ESS membership etc.) please note in case you want to discuss within ENSA

A national strategy document is still missing but considered as one of the priorities for the team discussing options for the future neutron-specific national association.

The Czech neutron community has been quite large (relative to the country size) and active for decades. Both the operation of several neutron scattering instruments at the research reactor in Řež and the membership at ILL (Czechia joined ILL as part of the CENI consortium in 1999) contributed to this positive development. However, the decreasing capacity of beamtime at large neutron facilities abroad that could be used by Czech users represents a major challenge. This is underlined by the persisting lack of sustainable funding of the ILL membership and/or dedicated beam time elsewhere. While the Czech Republic is a member of ESS ERIC and aims at funding access to about 2% of ESS capacity in future, the start of ESS operation is now planned to 2028 and further decade-long ramp-up period to the full scientific capacity must be expected. Securing the membership at ILL and access to neutron beams at large facilities in the coming decade(s) is therefore vital for research community in Czechia. A decade long gap in the possibility of accessing neutron scattering facilities may affect new generation of scientists in the first place. Moreover, it would have negative impact on the involvement of Czech users in exploitation of the future research capacity of ESS. Ongoing discussions within the community thus focus on possible strategies for securing sufficient funding of access programmes in near future.

What about the situation related to the age of the members - is there a young generation of neutron scientists, are you active in developing it?

There is no visible generation gap in the neutron community, although statistics based on age cannot be provided for obvious reasons (GDPR). One indication that young generation of scientists is strongly present among Czech neutron users is the award of two Erwin Felix Lewy Bertaut Prizes for young scientists from Czechia (2009: Lukáš Palatinus, 2022: Lukáš Gajdoš). The fact that new (presumably young) generation of scientists is continuously involved in research using neutron methods can be also demonstrated by the publication statistics, which shows significant percentage of new authors of “neutron publications” who appear in the Scopus database every year (Figure 3).

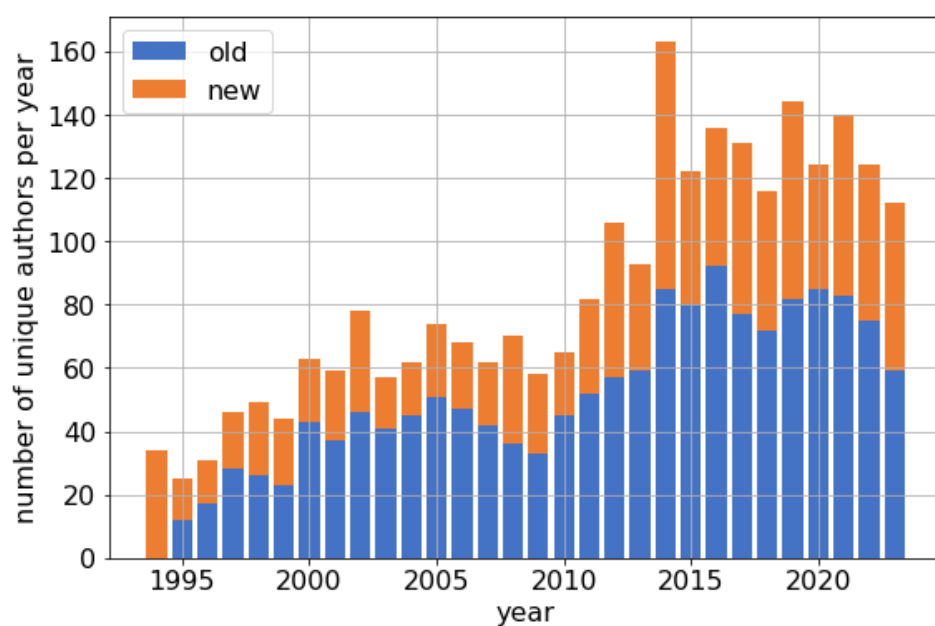


Figure 3. Number of unique CZ authors in the database of “neutron publications” filtered out from Scopus. The methodology is the same as described in the ENSA paper.