



Recognition of individual achievements in our large scientific collaborations

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On behalf of the Working Group on the topic (Stan Bentvelsen, Roger Forty, David Milstedt, Peter Schleper, Antonio Zoccoli, + ECFA Chairperson and Secretary, current and incoming)
PECFA meeting, July 20th, 2018, ALBA, Spain

Community wide topic to be addressed with a community wide approach

- Within the role and responsibility of ECFA, a temporarily working group was formed by RECFA to address the topic.
 - ✓ Verify how short the bridges can be between the achievements of individuals and making these achievements know to the community outside scientific collaborations;
 - ✓ To inform the panel discussion, we collected information from already 21 medium or large collaborations (29 were contacted) of CERN-based or CERN-recognized experiments;
 - ✓ Based on the outcome of the discussion today we might opt for a community wide survey with educated and focused questions, and with a timescale before the PECFA meeting at CERN (Nov 2018), such as to be timely for input to the European Strategy update;
 - ✓ To work together with the ECFA Chairperson to disseminate the information (and potential recommendations) to the community, with the aim to deliver input to the European Strategy for Particle Physics Update.
- Working group: Stan Bentvelsen , Peter Schleper, David Milstedt, Antonio Zoccoli, Roger Forty, + ECFA chairperson and ECFA secretary (current and incoming)



Collaborations contacted (typically the Chairperson of the Collaboration Board)

ALICE, AMS, ANTARES, ATLAS, Auger, AWAKE, BELLE II, Borexino, CLOUD, CMS, COMPASS, CTA, EDELWEISS, EUCLID, IceCube, ISOLDE, JUNO, Katrin, KM3NET, LHCb, LIGO, NA61/SHINE, NA62, NEXT, nTOF, PANDA, SNO+, T2K, VIRGO



Warning

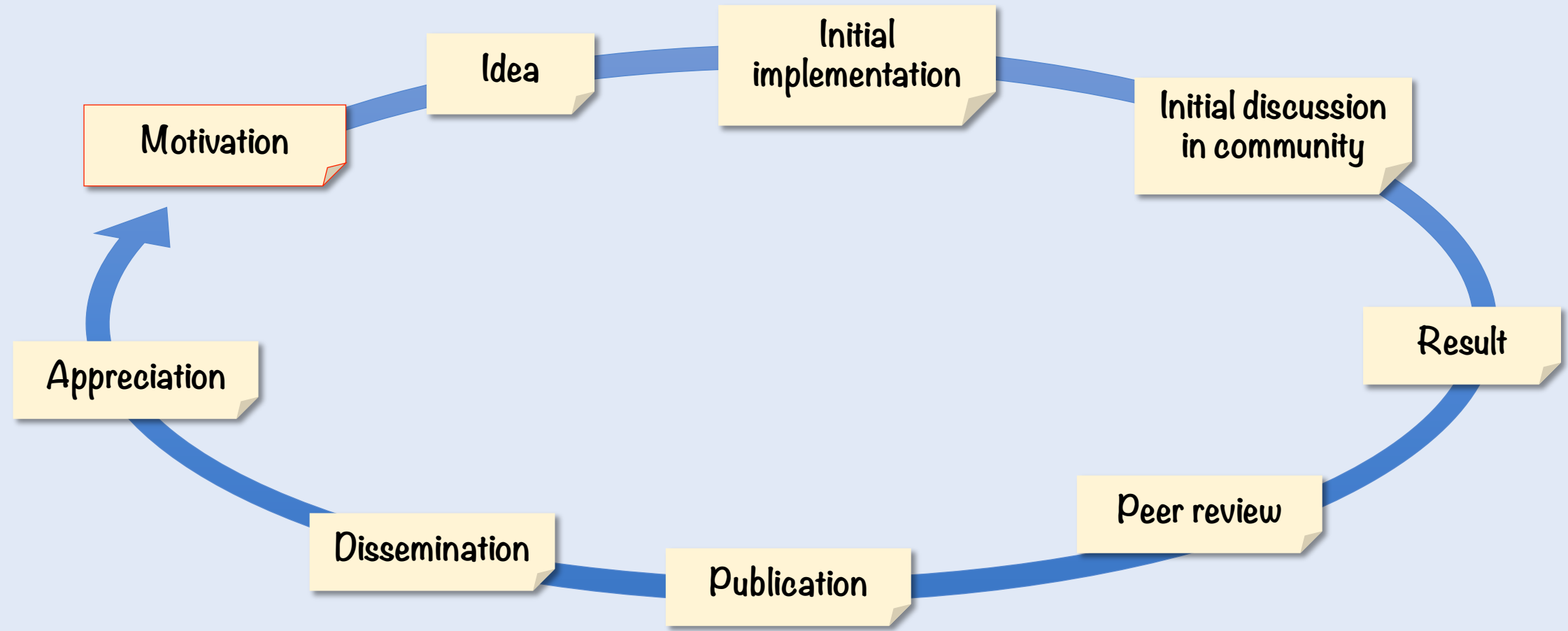
The matter is complex.

Collecting information and opinions, as well as formulating conclusions and recommendations will take time.

- Some related documents are uploaded to the indico page
 - IUPAP-C11, “*Report of the Working Group on Authorship in Large Scientific Collaborations in Experimental High Energy Physics*”, 2006
http://archive.iupap.org/commissions/c11/reports/WG_authorship_100105.pdf
 - IUPAP-C11, “*Assessment of Individual Achievements in Large Collaborations in Particle Physics*”, 2008
<http://archive.iupap.org/commissions/c11/reports/wg-assessment-08.pdf>
 - ECFA/HEPP-EPS, “*Memorandum on the evaluation of Experimental Particle Physicists*”, 2015
https://cds.cern.ch/record/2014643/files/ecfa-291_ECFA-HEP-evaluation.pdf

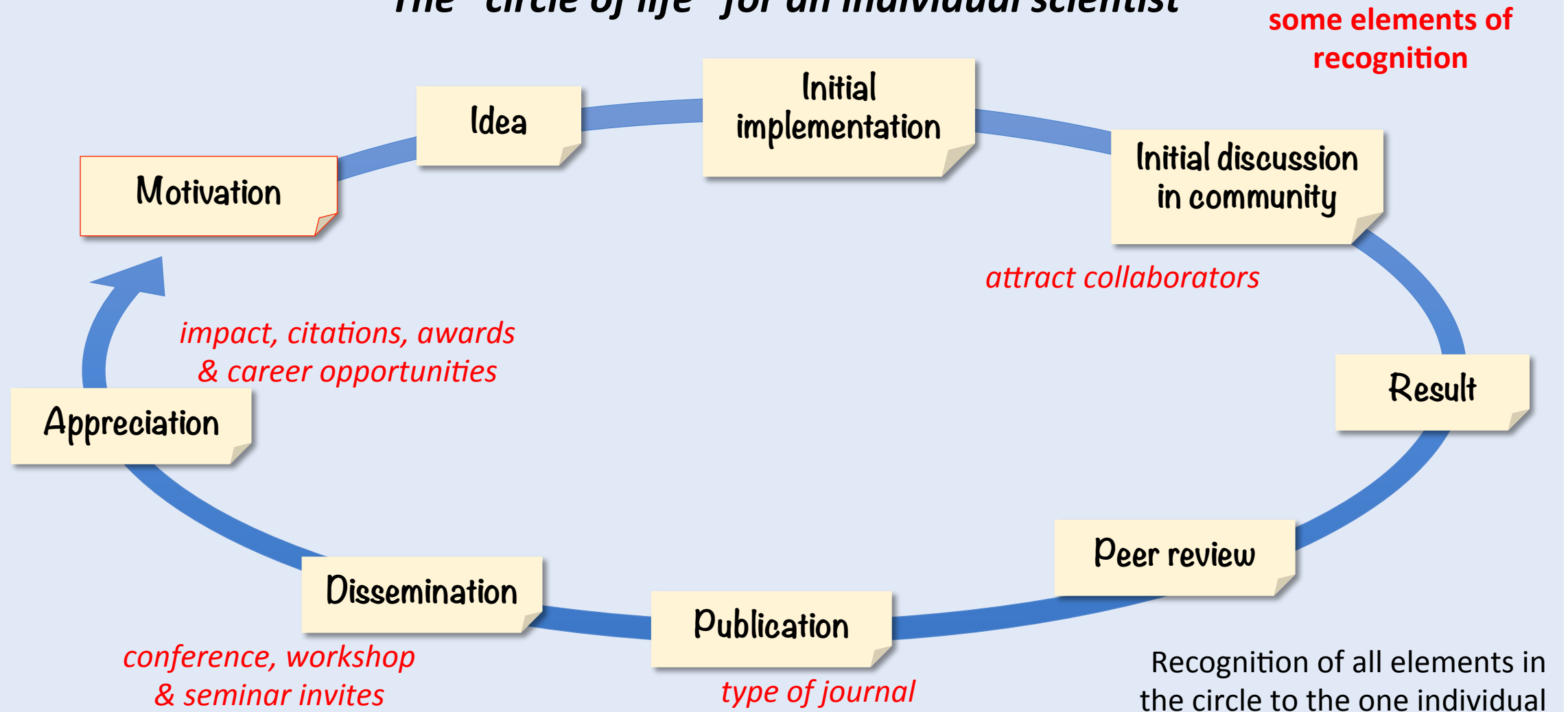


The "circle of life" for an individual scientist

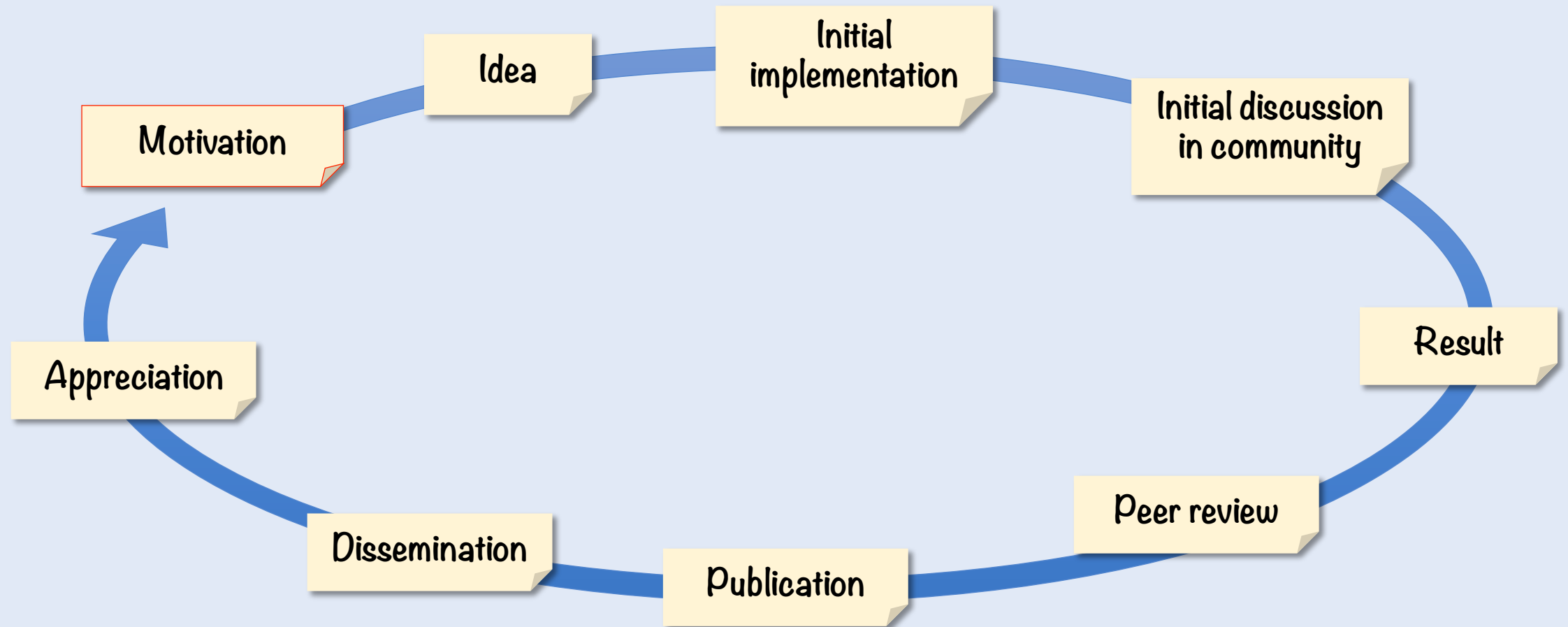




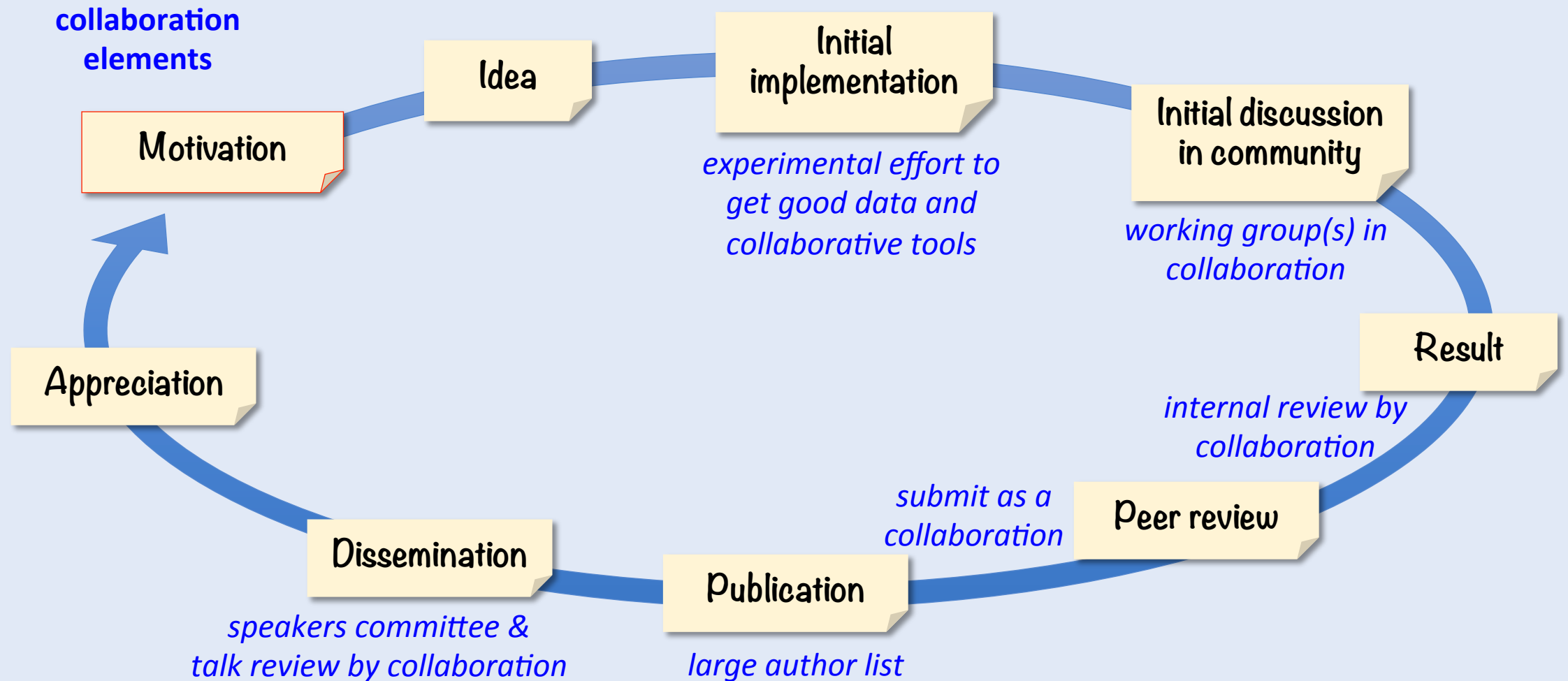
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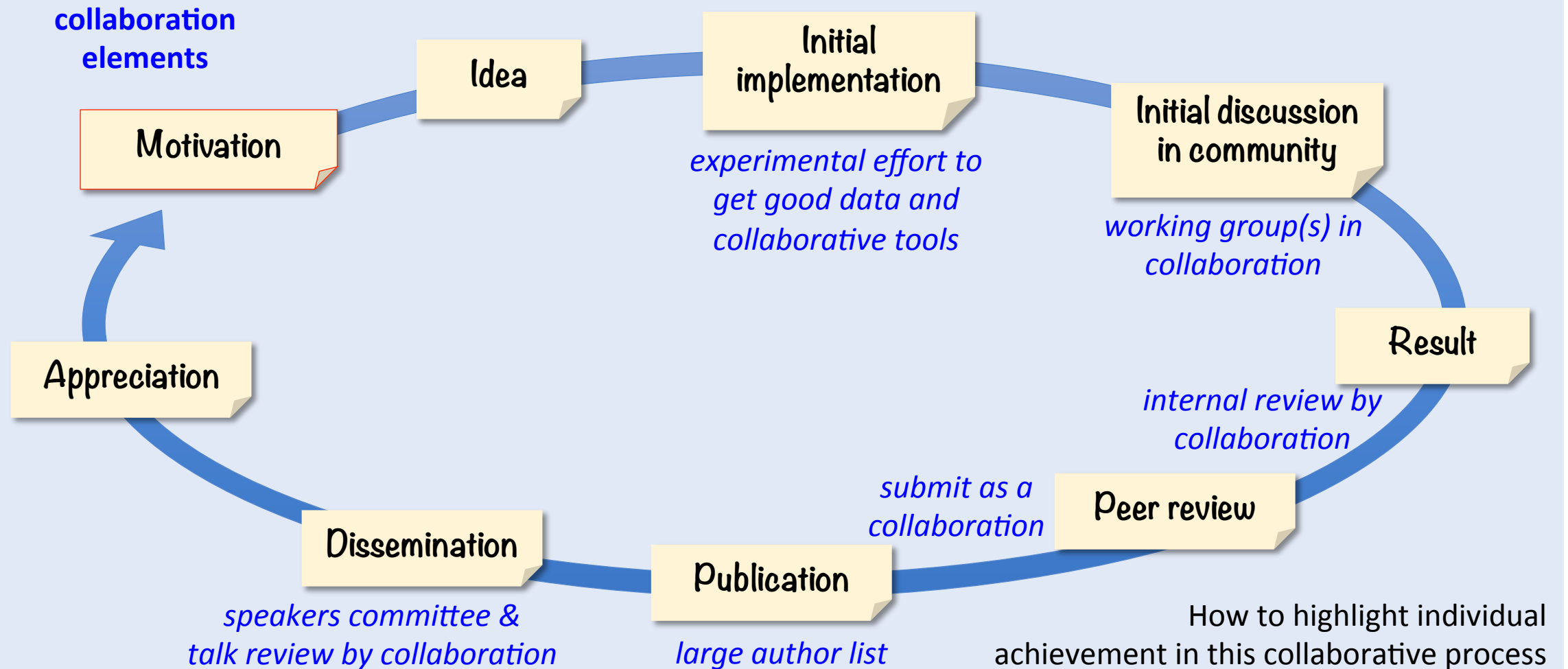
The “circle of life” for an individual scientist in a large collaboration



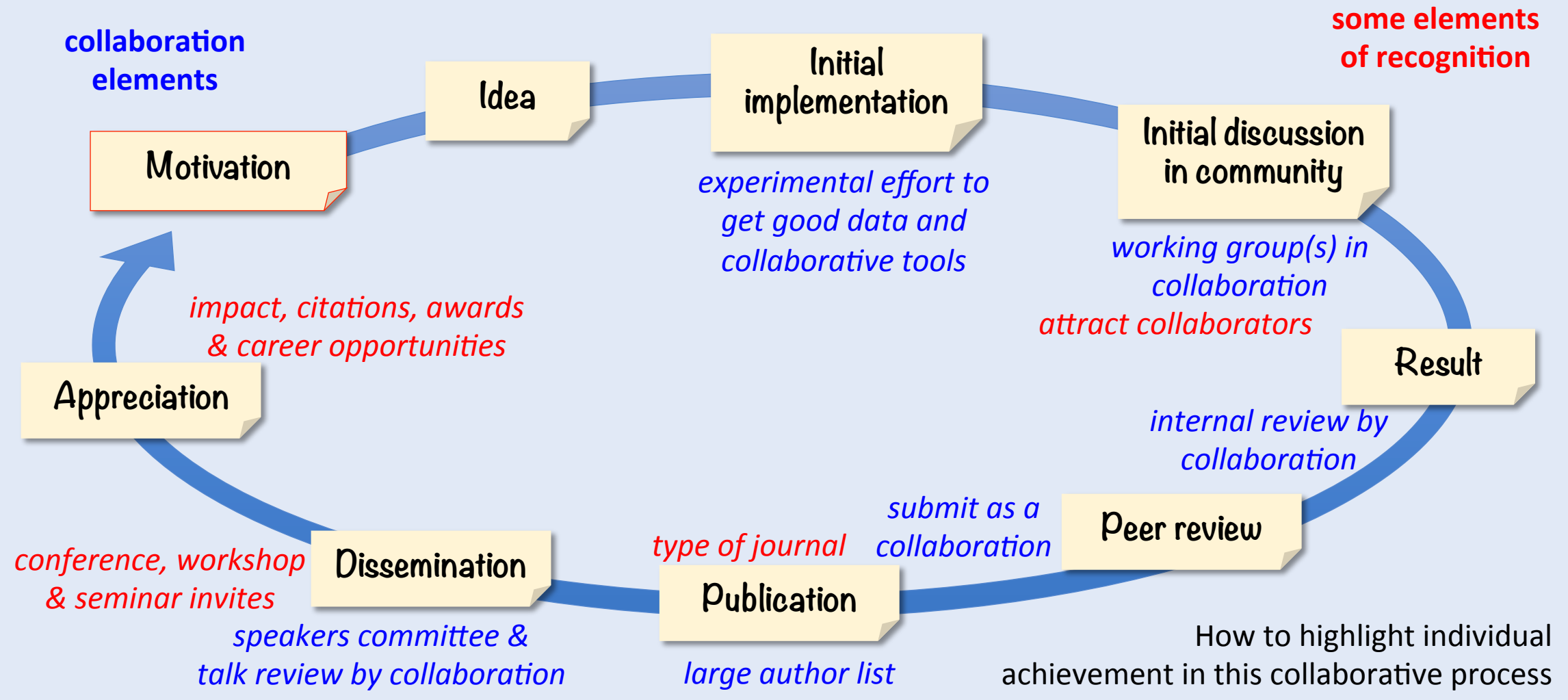
The "circle of life" for an individual scientist in a large collaboration



The "circle of life" for an individual scientist in a large collaboration



The "circle of life" for an individual scientist in a large collaboration



Quotes from leaders of the contacted collaborations

“Indeed, this is a crucial topic in large collaborations, and I will say that the [NN] Collaboration is struggling to find adequate means to adequately maintain recognition of those not involved in the most visible scientific products, and we would very much like to learn from other collaborations on how to dynamically pursue best practice on this front.”

“This looks like a valuable ECFA effort that you are undertaking. Thanks.”

“We fully agree on the importance of the recognition of individuals in scientific collaborations. Your initiative on this topic is extremely welcome and we will look forward to the outcome.”

“We appreciate a lot this initiative, since by no doubt recognition of individuals in a field like ours, in which the work is more and more organized as large Collaborations, is becoming a very pressing topic.”

Quotes from leaders of the contacted collaborations

“Your request was very helpful in reminding us that in this area there is significant potential for improvement!”

“It is my strong belief that the current rules of authorship in most (if not all) experiments are not giving due credit to the work done by specific individuals. I fully appreciate that this is not easy, and any change of the "status Quo" will require significant conflicts to be resolved. However, I feel that it is time for our community to address these issues in a manner that addresses the real problem.”

“I feel that we need new ways to address the issues of recognition and reward of individual contributions. If we do not accomplish this in the very near future, we run into the trouble of facing a new generation of researchers/scientists who simply will not be willing to come into particle physics, simply because their work will have no way to be recognized and appreciated to the extent that it will have a significant impact in their career. Maybe new sets of rules for authorship are needed. Maybe, new designations of authors could help. In any case, I wish that ECFA and your working group becomes the starting point of some serious discussion on a possible reformation of the existing rules/practices.”

Questions asked to the collaboration leaders

1. What procedures exist within your collaboration to recognise the achievements of individuals?
2. What measures are taken to make the recognition as transparent as possible for the community outside the collaboration?
3. Are potential new actions being considered to further strengthen the system of recognising individual achievements in your collaboration?
4. What measures are taken to continue to recruit the most talented young researchers in the collaboration, and how is the efficiency of the recruitment evolving?
5. To the best of your knowledge, what is on the minds of the (young) researchers in your collaboration concerning the current system to recognise individual achievements? What is perceived positively or negatively, and what are the challenges? In case you have some form of "young researchers panel" in your collaboration, we would certainly welcome their opinion, if available.

It was agreed that inputs and opinions are integrated in this presentation without naming the source.



An effort to summarise the input received

These are elements mentioned by the leaders of some collaborations, sometimes with a follow-up reflection.

Phase-transition from medium to large collaborations

- The size of our collaborations is a reflection of the experimental efforts required to perform a research programme. The size does not always scale with the diversity of potential results.
- This can lead to the need of many researchers in a collaboration for too few key results/publications, i.e. “**the small fish in a big tank effect**”.
- The number of publications and conference talks is in general much smaller than the total members of a collaboration. A purely quantitative resume is not adequate to recognise bright individuals. Qualitative elements of individual achievements are very relevant, yet challenging to assess.
- **Concerning the ease of recognizing individual and qualitative achievements some phase-transition is observed from medium sized collaborations to large collaborations.**

Profile of research projects for individuals

- No issue of recognition if the collaboration is “data rich”, i.e. more research opportunities than researchers can handle.
- Stimulate and **reward those “doing rather than talking about doing”** was quoted.
- **Create a situation where one cannot hide behind the work of others.**
- **Recognition for technical contributions (hardware and software) is a challenge**, although these are often more demanding on the skills of the researcher.
- Focus in promotion and hiring systems on the number of publications is a benefit for analysts versus technical and development work.
- Collaborations are not directly responsible for the recruitment of researchers, which might be an issue for more technical oriented researchers profiles.



Conference assignments

- **Conference talks are mentioned to be a key recognition of (mostly early career) researchers.**
- In general assignment is done by a Speakers Committee within the collaboration.
- Typically also an adequate diversity and geographical distribution is used as a guideline next to excellence, i.e. not only scientific excellence and individual achievements.
- Collaborations typically list past and present conference talk assignments on an internal website to create transparency and open opportunities.
- Research fellows need their own travel funds (including CERN fellows) in order to work towards an independent researcher.



Conference contributions format

- The format of the presentations typically follows the standards of the collaboration.
- If conference talks are a key element for individual recognition, **there might be a need for more freedom of the presenter for creativity and intellectual input in designing the talk/poster**. A presentation at a conference (or internally) is one of the rare moments that an individual can demonstrate his/her talents.
- Should a presentation have only one author, or can it be a small group of collaborators?



Proceedings and conference papers

- Some collaborations submit first author papers as conference contributions (reviewed by the collaboration and on arXiv).
- Possibility to cite conference proceedings and doctoral thesis in publications of collaborations, and to actively stimulate/monitor this.

Promotions and careers

- The system is non-ideal with recognition statements significantly relying on senior collaboration members.
- The academic promotion systems are disconnected from the collaborations.
- The planning horizon of the projects of the collaboration sometimes does not cover a significant enough fraction of a scientific career. This reduces the impact of the collaboration on the career planning and promotions.
- Our collaborations are typically collaborations of institutions, and the institutions bring in the individual researchers. This is structural knot on the bridge between the individual and the collaboration.
- The uncertainty period towards a permanent job needs to be adequate in length (i.e. not too long), hence timely recognitions for early career researchers are essential.

Publications: currently deployed options (or considered)

- **Opt-in scheme for authorship**, but typically without formal requirements.
- **First author concept** and corresponding author, typically for early career researchers.
 - The identification of only one person is typically not the reality of the work done.
 - This option seems attractive to recruit young and motivated talents.
 - Socially damaging discussions in large collaborations to select “first” authors, i.e. would change the modus-operandus in the analysis groups.
- Concept of “first author group”.
- PIs at the end of the author list.
- **Alphabetic author list**, hence the identity of the main contributors is not visible.
- Add an alternative author list through acknowledgements of a handful of people (but claimed this failed in previous collaborations).
- First come, first serve basis for publication of analysis results in large collaborations is an issue.

Publications: additional and novel ideas

- In several responses it is explicitly or implicitly mentioned that our procedures with respect to author lists for very large collaborations is to be revisited.
- The collaboration could list some publications for a collaboration wide author list, while other publications can be published with a shorter author list.
 - How can one individual (or a small group) decide to publish?
 - How free are the collaboration members to use the data/software of the collaboration for few author papers?
- Breakdown/factorise the overall very large collaboration into smaller sub-collaborations each with their own publications. This brings the large collaboration back to the level of smaller and manageable collaborations with easier first author concepts.
- **Opportunity to publish new technical and analysis ideas with few people.**
- Being listed on the author list of internal notes is considered a recognition when available.
- Being the contact(s) for an analysis is considered a recognition (typically internal information).
- Being the person uploading the article to arXiv (name visible publicly) is considered a recognition.

Awards: typical regular awards

- Doctoral **thesis awards** for different categories, e.g. technical, detector, physics analysis, etc.; this can also proceed across collaborations, i.e. community wide.
- Selection to present work at a plenary meeting of large collaborations, i.e. **internal “invited talks”**.
- Summer student awards, or bachelor/master student awards.
- **Early career, achievement, impact awards** for outstanding contributions.
- Prizes for best talk/poster during collaboration meetings.

- For these awards the peer review was done during to the selection of the award.
- **Sense of bias towards more influential research groups or institutions for recognition positions.**
- Need to make the “awards” and “positions” known and recognized outside the collaborations (including the history of these).



Awards: directly external to the collaborations

- Exposure of individuals on (social) media. But how to select and organise to get the right individuals exposed, i.e. those connected to the achievements?
- Use alumni networks to highlight individuals.

Some awarding roles

- Appointment as **coordinator/convener is a strong recognition**, when the selection deploys a collaboration wide consultation and call for nominations. These selections typically take into account as well diversity elements, hence not only based on scientific excellence.
- Selection/participation in **internal review committees**.
- Being member of **conference and/or publication committees**.
- **Responsible role in the data-taking process**. Weekly coordination of the experiment (for smaller experiments where overview and oversight is possible).
- “Liaison” roles for an analysis towards internal working groups.
- Weekly collaboration meetings chaired by early career researchers for a fixed period.
- Invite early career researchers to high-level management meetings, i.e. involve them in the decision making.

- A brief statement “person NN was coordinator of MM” is a typical indication. **Which peer-review system to verify how person NN performed the role as coordinator of MM?**

Committees to inform the collaborations top-down and bottom-up

- Setting up a “Diversity Committee” or “Early Career Committee” or “Inequality Committee” or a combination helps to create a supportive environment in the collaboration, and it can act as a point of contact for researchers that feel disadvantaged.
- Creation of a “Young Scientists” or “Junior Researchers” committee with direct links to the management of the collaboration and with explicit involvement in the decision making.
- **Some collaborations are too small to create a “Young Scientist Committee”. One might connect across collaborations with more community wide “Young Scientist Committees”.**

Network and networking

- **Networking is stated to help towards recognition**, i.e. internal and external networking between early career and senior people (i.e. typically team leaders). **But this assumes equal networking skills and opportunities for all members.**
- **Reference letters as a key element** to provide statements of recognition is promotion systems.
- Networking of PIs towards the outside community can help to promote the younger researchers of their collaboration.
- Certification of individual achievements by management upon request.
- **Dynamic people become quickly well-known. But how to connect this to scientific qualifications?**
- Some external organisations publish lists of most influential scientists based on quantitative elements. Not necessarily the best basis to “rank” scientists.



Hiring

- Hiring young researchers becomes truly global with respect to more regional.
- **Involve young researchers in cutting-edge and challenging projects will motivate/attract them and prepare them optimally for their career.**
- Advertise all job opportunities community wide, and stimulate/facilitate cross-collaboration careers.
- Announce master/bachelor projects and value them by the collaboration as a tool to attract talents early on.
- Recruitment is challenging because the prospect of limited permanent positions.
- High technical barrier to enter collaboration can be addressed with adequate tutorials and schools within the collaboration.
- A common challenge of underground non-accelerator experiments to recruit the best young talents. This might become a challenge for the particle physics community at large.
- **An optimal recognition system of individual achievements might mitigate hiring challenges.**



Next steps

There is new physics out there to be discovered and the reward might be historic.

The typical datasets of our large experiments are goldmines. The discovery of a scalar sector is not the end. It opened an additional window for further exploration through searches and measurements.

The “circle of life” has to motivate the brightest individual researchers to engage.

Their efforts and innovations are to be matched with adequate individual rewards.



Next steps

Please contact the ECFA chair and/or the working group with further thoughts.

Do not hesitate to discuss these matters within your institute/community, and to provide us with additional information.

This is not the end of an exploration, but the start (or the continuation) of an effort for an important aspect of our scientific organisation.

Potential questions for the panel

1. Do the arguments of large collaborations to publish with an inclusive author list still hold? What might be the pros and cons of the alternatives?
2. There seems to be a phase transition from “first author/group” concepts in smaller collaborations to “inclusive” author lists in larger collaborations. Are there options to avoid this phase transition?
3. How did the “small fish in a big tank” perception evolved of the years, and how might it further evolve? How can we mitigate this?
4. Should we appreciate if a researcher includes some personal intellectual creativity in a conference talk? Do the collaborations appreciate or stimulate this?
5. Are there systems in the collaborations to evaluate the performance of individuals in coordination/convener/responsibility roles?
6. Networking might be relevant to explore career opportunities, hence how do collaborations help in creating an equal opportunity basis for networking?
7. How can we further strengthen the impact of the voices of Young Scientists in our collaborations?