Authorship of HEP Publications

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International Union of Pure and Applied Physics

*) The organization supporting HEP worldwide, for instance, overseeing the ICHEP and LPS.
In the past, the larger HEP collaborations have had 200 – 600 members; this is growing to 2000 for the large LHC experiments.

Current policies for authorship of scientific papers reflect the high energy physics tradition that detector design, construction, and operation is carried out by the same team of physicists that also performs the physics analyses.

Thus, publications are the outcome of joint efforts by the collaboration, not just the few individual scientists who initiate and perform a specific analysis and prepare a publication.

Active members who have contributed to the experiment for at least 6 to 12 months are entitled to authorship, practically all of them sign publications.
In 2004/05, members of C11 posed the question:

What is the impact of growing Author Lists?

- Do they appropriately credit those who have contributed most?
- Can we accept the fact that many of the authors are not very knowledgeable about the contents of their publications?
- How can readers identify and contact those most knowledgeable?
- What is the purpose and value of being an author?
- Do the individual publication and citation records remain important?

C11 formed a WG charged to

- Examine current practices in HEP and other fields
- Explore benefits and potential modifications and alternatives
- Sample the opinion of the HEP community
- Prepare a report to submit to C11 and make it widely available
C11 Working Group on Authorship

Members

C11 of IUPAP:
Gregor Herten
Vera Lüth (chair),
Steinar Stapnes,
Taku Yamanaka

Others:
Hiro Aihara
Lorenzo Foa
Jacques Chauveau
Dmitri Denisov
Hans-Ake Gustafsson
Max Klein
Pippa Wells
Jack Sandweiss
Daniel Whiteson

Belle
CMS
BABAR
D0
ALICE
H1/ZEUS
ATLAS
APS
CDF
Authorship and Types of Publications

- **Publications of physics analyses – All Members**
  - signed by all eligible members of the collaborations:

- **Contributions to conference proceedings – Single Author**
  - in the form of write-ups of an invited talk by an individual, usually representing the collaboration.

- **Scientific Notes – Few Selected Authors**
  - Most collaborations document physics analyses in great detail in internal reports prepared by a small group of scientists: LHC experiments hope to publish scientific notes in journals.

- **Technical publications - Few selected Authors**
  - covering detector design, construction and operation, as well as advances in electronics, data acquisition, computing and software

- **In the following, we focus on journal publications of physics results based on shared data.**
WG on Authorship: Common Current Practice

Questions:

- Should this practice be extended to Collaborations with 2000 scientists?
- Does this form of collective authorship meet the APS rules for authorship, requiring significant contributions to justify authorship?
- How do we define significant contributions?
- If not via authorship, how else do we recognize individual contributions to physics analyses as well as technical innovation and support of operations?

Who establishes the rules?

- Most collaborations have a governing body, a council and an executive board; younger scientists have very little participation.
- The council establishes the rules, by decree they usually remain unchanged.
- The tradition established by the LEP experiments carries over to the LHC.
1st Alternative: Belle Practice

- The Belle Collaboration
  - 300 scientists from 56 institutions in 13 countries
- Prior to the publication members of the collaboration need to request authorship by responding to the following:

Please include me in the author list: YES/NO
- YES - I have read this paper and I agree with its contents
- NO - I have read the paper, I do not agree with its contents
- NO - I have not made sufficient contributions to this paper

- Belle allows for up to 3 primary authors who will be listed first, in the order chosen by the analysis group. While 90% of the first 30 publications had an alphabetically ordered author list, only 10% of the most recent 30 papers had authors listed in alphabetical order.
- All this is done without intervention by the Belle Management!
- This innovative practice enjoys the strong approval of Belle members!
Belle Practice: Number of Authors vs Time

![Graph showing the number of authors over time, with eligible authors and signing authors distinguished. The graph indicates that approximately half of the eligible authors are also signing authors.]
2nd Alternative – Partition into AWGs

- Partition into 10-15 AWGs
  - probably along the lines defined by analysis working groups (AWG), with all scientists participating in one, in some cases two, and in exceptional cases more working groups.

- AWGs specialize in different areas of physics
  - develop common analysis tools, meet regularly, and report progress and problems.

- AWG leaders interact frequently
  - with the physics coordinator, the computing and software teams as well as the detector operation teams.

- The federated publication oversight by the collaboration remains
  - through its publication board and analysis coordinators, Review Committees

- A sign-up for authorship like Belle
  - would allow individuals to decide case-by-case whether their contribution truly justifies authorship.

- Lead authors would be chosen and listed first.
- This scheme could reduce the author list by a factor of 10 or more.
Impact of Alternatives to Current Practice

- **Belle Practice: Sign-up for Authorship and – Lead Authors**
  - Authors are more knowledgeable, take responsibility for publication
  - Reduced authorlist was achieved without regulation from management
  - Emphasizing lead authors is considered attractive, has led to special recognition of young scientists!
  - Primary authors allow readers to identify contacts
  - Emphasis on analysis over contribution and innovation in software and hardware has not been a major issue!

- **Partition of Collaborations into Physics Analysis Groups**
  - Partition along physics topics already exists!
  - The active participation of more than a 50 - 100 scientists in the preparation of a publication is probably not practical anyway
  - A selective authorship may apportion credit in a more balanced, but less uniform way!
  - A longer list of primary authors could include also those who made technical contributions or consulted on physics
  - **CONCERNS:** Would coupling of AWG to authorship lead to friction and competition, to neglect of common tasks? to fission?
ALICE at LHC: 1000 scientists at 86 institutions.
- They plan to adopt the same practice as HEP.

The LIGO Scientific Collaboration (LSC): 400 members at 41 universities.
- Author list of scientific publications with all members of the LIGO Scientific Collaboration with rights to the data, plus engineers who contributed to the design, construction, or operation.
- LIGO has published few physics papers, plus a large number of technical papers signed by those involved in the particular work.

The Sloan Digital Sky Survey (SDSS): 200 scientists at 14 universities.
- They distinguish four types of publications with different author lists:
  1. Scientific publications signed by those directly involved in the data analysis as well as any members of the technical team who built the telescope;
  2. Data release papers, signed by the team of scientists who analyzed the data;
  3. Technical papers signed by those directly involved in the technical work;
  4. Follow-up papers on public data by a few authors with reference to SDSS. For the 100 scientific publications in print, the typical number of authors varies between 30 and 50.

The Human Genome Sequencing Consortium: 2000 authors at >100 institutions
- A variety of practices and members have reported that the responses have not always been positive.
- For some of the major publications, only 200 authors, mostly the team leaders.
Sampling of HEP Opinions

- Following discussion of various practices and the working group prepared a questionnaire to sample the community’s response to a few options for authorship.

- The questionnaire was distributed to the large collaborations via the www, and members of the WG on authorship acted as contacts.

- In total, 880 scientists responded, and the responses were tabulated by Daniel Whiteson of CDF.

- The response was voluntary and not uniform, ~50% of the responses were from senior scientists.
Questionnaire on Authorship

Current Practice

Q1: Do you consider the alphabetic listing of all members of the collaboration the appropriate way to credit those who contributed to the published research?

Q2: Do you support the introductions of a new class of publications, Scientific Notes, that document analysis methodology, detector and physics simulations, novel algorithms and software developments as a way of acknowledging individual contributions to the experiment and the physics results?

Q3: Would you support the proposal to have only the names of two contact persons printed above the name of the collaboration, and have the names of the remaining authors recorded in alphabetical order, accessible electronically?
Belle Practice

Q4: Would you consider a sign-up as practiced by Belle as a good way to identify and appropriately credit those who contributed most to the published research.

Q5: Would a reduction in the number of publications in which you are listed as author critically impact the support you and your colleagues receive from your home institution and funding agency?

Q6: Would you agree that the practice of listing in non-alphabetic order the names of up to ten scientists who contributed most to the published research is an effective way to identify the corresponding authors and give credit to those most deserving?
Subdivision into Analysis Analysis Consortia

Q7: Would you agree that a partition of the large collaborations into smaller physics research groups focusing on selected topics is an effective way to organize research activities while maintaining the support for detector operations and common software?

Q8: Would you agree that the partition into smaller physics research groups would also be an effective way to establish authorship, i.e. restricting authorship to members who have contributed directly and are most knowledgeable about the research results presented?
880 Respondents to Questionnaire

Collaborations

Career Status

Age Distribution

Gender Distribution

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Responses to Questionnaire:

-3 = NO  +3 = YES

Current Practice
Q1: Full Alphabetic Listing
Q2: Separate Scientific Notes
Q3: 2 Corresponding Authors

Belle Practice:
Q4: Sign-up for papers
Q5: Funding Impact?
Q6: Primary Authors

Partition into Analysis Consortia
Q7: Effective Organization
Q8: Restricted Authorship
Responses to Questionnaire

Medians of Distributions:

Current Practice
Q1: Full Alphabetic Listing
Q2: Separate Scientific Notes
Q3: 2 Corresponding Authors

Belle Practice:
Q4: Sign-up for papers
Q5: Funding Impact?
Q6: Primary Authors

Partition into Analysis Groups
Q7: Effective Organization
Q8: Restricted Authorship
Conclusions

- **HEP authorship is different** from what most scientists – especially those outside the field – expect it to be.

- All existing collaborations have rules in place that regulate membership and authorship. Members are usually authors, as long as they contribute to the experiment.

- The Belle Collaboration introduced voluntary sign-up and primary authors, and their practice is highly favored by its members.

- The C11 questionnaire provided some insight in how current practices are viewed – younger scientists appear to favor more recognition for those actively involved in physics analysis.

- Many senior members consider a change of rules unnecessary, and possibly damaging to the spirit of the collaboration.

- Obviously, C11 or IUPAP cannot and will not establish rules and expect the community to accept them!

- **Nevertheless, C11 hopes that these discussions have raised conscientiousness of this important issue.**

- Please take time to think about this – it is important to you and our field!