

1 Evolution of Regional, Age and Gender Demographics in 2 the ATLAS Collaboration

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7 The ATLAS Collaboration at the LHC consists of more than 5000 members, from over 100 different countries. Regional, age and gender demographics of the collaboration are presented, including the time evolution over the lifetime of the experiment. In particular, the relative fraction of women is discussed, including their share of contributions, recognition and positions of responsibility. The dependence on other demographic measures is also shown.

*** *The Tenth Annual Conference on Large Hadron Collider Physics Conference - LHCP2022* ***

*** *16 - 20 May, 2022* ***

*** *Online* ***

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8 This proceedings presents studies on gender, age and geographic diversity within the ATLAS
 9 Collaboration at the LHC [1]. Information is collated from the CERN Human Resources (HR) and
 10 ATLAS databases, and the plots shown here [2] provide an update to those presented in Ref. [3].
 11 To determine a person's region, the location of their home institution is used, whilst their gender is
 12 established based on their government-issued ID. The evolution of ATLAS demographics is probed
 13 by considering three time periods which correspond to distinct events in ATLAS: construction
 14 (1998–2009), Run-1 of data-taking (2009–2014), and Run-2 of data-taking (2014–2019).

15 A first overview of the ATLAS collaboration is found in Figure 1 through the total numbers of
 16 *authors* — people who sign ATLAS publications (a subset of the *members*, who may not do so).
 17 This number has been increasing continually, reaching ~ 3000 in 2019. The fraction of authors
 18 who are women is increasing concurrently; the value in 2019 (20%) is taken as a reference in later
 19 figures in this proceedings.

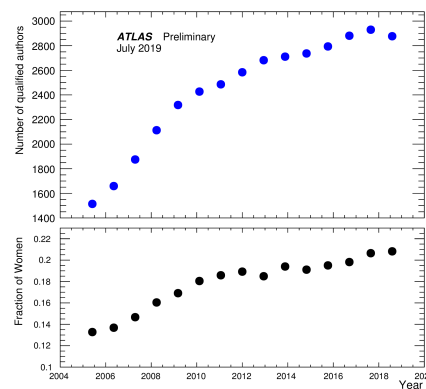


Figure 1: The total number of ATLAS authors on July 1st in each year in 2005–2019. The lower panel shows the fraction of those authors who are women, given the CERN HR database's options of man or woman [2].

20 Regional distribution of ATLAS authors is considered based on the following region definitions:

- 21 • Asia: Armenia, Azerbaijan, China, Georgia, Japan, Taiwan
- 22 • Eastern Europe: Belarus, Czechia, Poland, Romania, Russia (+ JINR Dubna), Serbia, Slo-
- 23 vakia, Slovenia
- 24 • Mediterranean: France, Greece, Israel, Italy, Portugal, Spain, Turkey, Morocco
- 25 • North America: Canada, USA
- 26 • Northern Europe: Austria, Denmark, Germany, the Netherlands, Norway, Sweden, Switzer-
- 27 land (+ CERN), UK
- 28 • Southern Hemisphere: Argentina, Australia, Brazil, Chile, Colombia, South Africa.

29 Figure 2a shows that the fastest increase in author number has occurred in Asia, North Amer-
 30 ica and Northern Europe, whilst Eastern Europe has remained roughly constant. In all regions,
 31 apart from the Mediterranean, the fraction of women authors has increased consistently. The
 32 Mediterranean has the highest fraction of women authors overall, whilst Asia has the lowest. More
 33 geographic detail can be seen in Figure 2b.

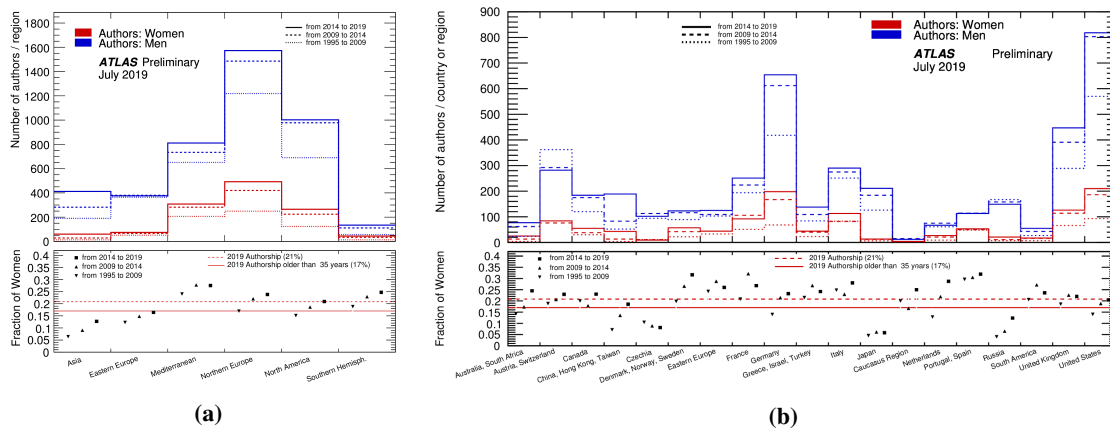


Figure 2: ATLAS author affiliation (a) region, and (b) geographic distributions. The data is split into three time periods: 1995–2009, 2009–2014, 2014–2019. The lower panel shows the fraction of the authors in each region and time period who are women, given the CERN HR database’s options of man or woman [2].

34 The role of women in ATLAS is studied by counting the fraction of women in leadership
 35 roles in Figure 3. The seven categories of role shown have two-year terms apart from the Speakers
 36 Committee, which has a three-year term. Institutional leaders are chosen by the institute rather
 37 than ATLAS, but otherwise the ATLAS Collaboration chooses who has these leadership roles. The
 38 fraction of women in leadership roles has increased between Runs 1 and 2 across all categories, in
 39 most cases exceeding the overall fraction of ATLAS authors who are women.

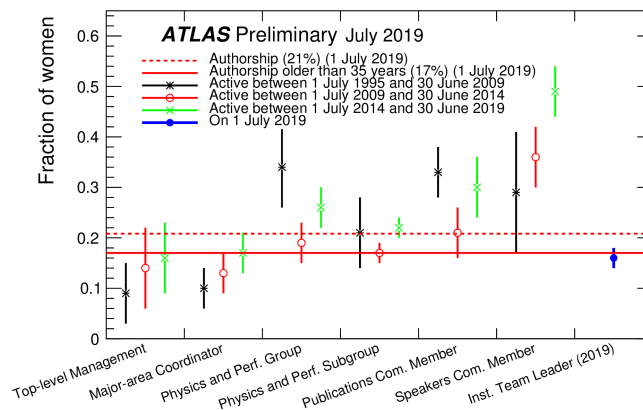


Figure 3: The fraction of women with leadership roles at ATLAS. Red lines indicate the average fraction of authors who are women in 2019, overall or above age 35. Data is shown for each individual term in office. Institutional team leader is shown for 2019 only, whilst other categories are shown for three time periods. Gender information is derived from the CERN HR database, from the options man or woman [2].

40 The ATLAS collaboration has ‘ATLAS Week’ collaboration meetings three times per year, and
 41 the fraction of plenary talks given by women at these are shown in Figure 4. In this case gender
 42 information is derived from the speaker names. The fraction of women giving plenary talks in each
 43 year exceeds the overall fraction of ATLAS authors who are female.

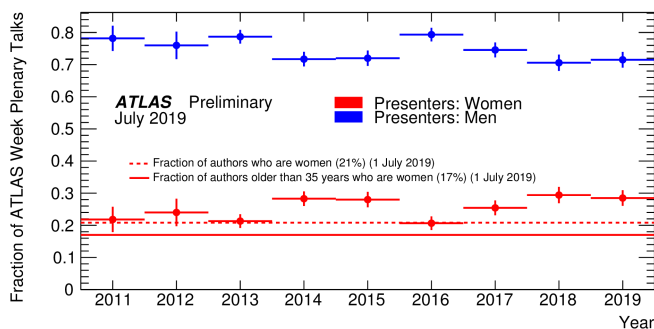


Figure 4: The fraction of ATLAS Overview Week plenary talks given by each gender per year. Horizontal red lines indicate the average fraction of authors who are women in 2019, overall and those above age 35 [2]. Gender information is derived from first names using <http://genderize.io>.

44 ATLAS membership age spans at least five decades, as shown in Figure 5a. Most of the
 45 collaboration is below 40 years old, and as time progresses the average age of members is decreasing.
 46 The fraction of members who are women reduces as the member age group increases, though as
 47 time progresses the fraction of women in each age bracket has increased. This behaviour is similar
 48 for authors, as seen in Figure 5b.

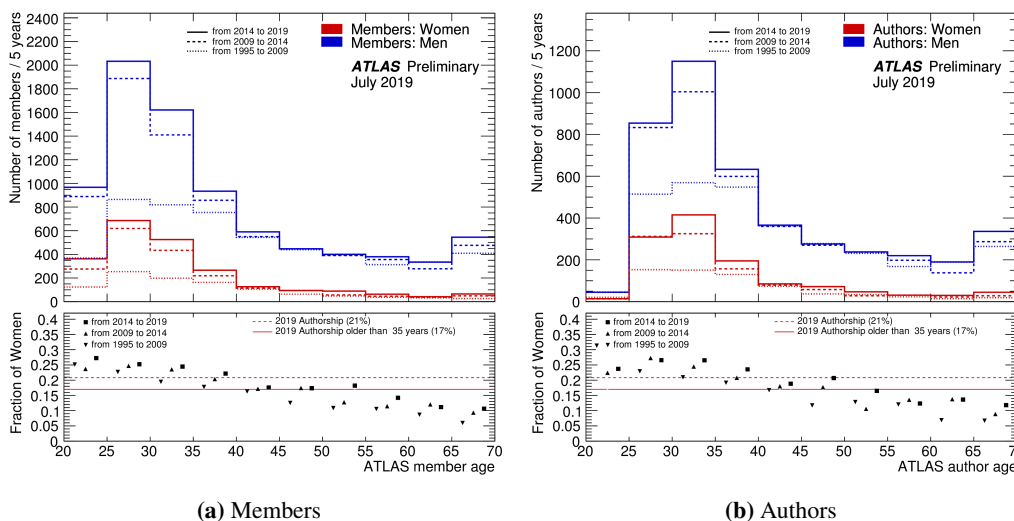


Figure 5: ATLAS age distribution of (a) members and (b) authors. The data are split into three time periods and gender. The lower panel shows the fraction of the authors in each time period and age group who are women, given the CERN HR database’s options of man or woman [2]. The final bin includes overflow.

49 In conclusion, the regional, gender and age demographics of the ATLAS collaborations were
 50 presented over three periods of time, encapsulating detector construction, Run-1 and Run-2. The
 51 fraction of ATLAS authors who are women varies substantially in different regions, and decreases
 52 with age, however it has increased with time in most categories, with women comprising 21% of
 53 the ATLAS authorship in 2019. Furthermore, the fraction of leadership roles and ATLAS week
 54 plenary talks taken by women has increased with time and currently exceeds 21%.

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57 **References**

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