

Scientific Writing Studio: How publishers can help authors to write smarter and faster

Agnes Henri^{1,*} and Charlotte Van Rooyen^{1,**}

¹EDP Sciences, 17, av. du Hoggar - BP 112 - 91944 Les Ulis Cedex A, France

Abstract. Researchers are under pressure: publish or perish is one of their main challenges. Writing is hard and scientific writing is harder, and any help Publishers can provide to assist with the process is greatly appreciated, especially by younger authors. EDP Sciences and Astronomy & Astrophysics (A&A) have worked together to support their authors and developed a solution called **Scientific Writing Studio (SWS)** designed to make the article writing process easier. **SWS** is a tool that allows authors to collaboratively write their paper, then submit and then follow all stages of the publication process within a single unique interface. This paper explains the background to the development of the **SWS**, and describes the current benefits of the **SWS** as well as outlining future developments.

1 Background

A&A has been publishing the best astronomical research for over 45 years and is the first choice for publication of important special issues including those from the missions of Planck, Herschel, Rosetta and Gaia (Fig. 1). This means there are often many contributors to the same paper (Fig. 2).

The Editors-in-Chief of A&A conceived the idea of the **SWS** in 2013.

The Editors Dreamland (Fig. 3) was to create a collaborative writing tool where authors could work with their co-authors using journal templates and eventually be able to submit their articles directly to the Journal.

2 Development

The writing studio work group tested a number of online collaborative LaTeX writing tools, and considered ways of adapting these tools to the specific needs of A&A. The key requirements at that time were: the usability of the interface, the ability to promote the A&A brand, and the ease of integrating A&A specific tools and services into the interface.

*e-mail: agnes.henri@edpsciences.org ORCID: 0000-0001-7928-2060

**e-mail: charlotte.vanrooyen@edpsciences.org

Astronomy & Astrophysics (A&A): Special issues

- ▶ HESS (Open)
- ▶ The VLA-COSMOS 3 GHz Large Project (Open)
- ▶ Gaia Data Release 1 (Open)
- ▶ XXL Survey: Second series (Open)
- ▶ GREGOR first results (Open)
- ▶ Planck 2015 results
- ▶ The XXL Survey: First results
- ▶ Rosetta mission results pre-perihelion
- ▶ Planck 2013 results
- ▶ GREAT: early science results
- ▶ Planck early results
- ▶ Herschel/HIFI: first science highlights
- ▶ Pre-launch status of the Planck mission
- ▶ Herschel: the first science highlights
- ▶ Science with AKARI
- ▶ The CoRoT space mission: early results

Figure 1. Some of the special issues published by Astronomy & Astrophysics

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Gaia Data Release 1

**Astronomy
Astrophysics**
Special issue

Summary of the astrometric, photometric, and survey properties

Gaia Collaboration, A. G. Bailer-Jones¹, A. Vallenari², T. Prusti¹, J. H. J. de Bruijn³, F. Miglio⁴, R. Brinmann⁵, C. Babusiaux⁶, C. A. Balser-Jones⁷, U. Bastian⁸, M. Biermann⁹, D. W. Evans¹⁰, L. Eyer¹¹, J. Janco¹², C. Jordi¹³, D. Katz¹⁴, S. A. Kluge¹⁵, U. Lammers¹⁶, L. Lindergren¹⁷, S. Lutz¹⁸, W. O'Mullane¹⁹, C. Paresi²⁰, D. Poitras^{21,14}, S. Randic²², P. Sartoretti²³, H. I. Sillido²⁴, C. Soubra²⁵, V. Vici²⁶, F. van Leeuwen²⁷, N. A. Wicenec²⁸, C. Aerts²⁹, F. Anselmi³⁰, M. Ceppe³¹, E. Hatzidimitriou³², E. Hatzidimitriou³³, E. Geisel³⁴, A. D. Holtzman³⁵, C. Hatzidimitriou³⁶, N. Pasetti³⁷, M. Poretti³⁸, L. Bramante³⁹, C. Cocconi⁴⁰, J. Casado⁴¹, C. Chiou⁴², N. Chokri⁴³, F. De Angeli⁴⁴, C. Fabricius⁴⁵, R. Giers⁴⁶, J. Hensler⁴⁷, A. Jean-Avancine-Favre⁴⁸, E. Moutou⁴⁹, R. Moutou⁵⁰, K. Nataraj⁵¹, M. Nardelli⁵², D. O'Keefe-Bianco⁵³, P. Pancino⁵⁴, J. Poretti⁵⁵, J. Richards⁵⁶, M. Reifel⁵⁷, D. M. Sestakovic⁵⁸, P. Tanga⁵⁹, J. Thémelin⁶⁰, J. Tjems⁶¹, S. G. Ed^{62,63}, G. Garcia-Bermejo⁶⁴, G. Comoretto⁶⁵, M. Garcia-Bermejo⁶⁶, T. Lask⁶⁷, E. Mignard⁶⁸, M. Altmann⁶⁹, R. Andrich⁷⁰, L. Azzam⁷¹, J. Bellas-Velazquez⁷², K. Benhafi⁷³, J. Berthiaume⁷⁴, R. Brusa⁷⁵, G. Busso⁷⁶, A. Cellino⁷⁷, G. Clementini⁷⁸, S. Cowell⁷⁹, G. Croceny⁸⁰, J. C. Cyganer⁸¹, M. Davidson⁸², J. De Ridder⁸³, A. de Tassis⁸⁴, I. Debehbacher⁸⁵, A. Dell'Oro⁸⁶, C. Ducourant⁸⁷, Y. Prémont⁸⁸, M. García-Torres⁸⁹, E. Goswami⁹⁰, J.-L. Hübner⁹¹, S. C. Hanley⁹², D. L. Harriss⁹³, M. Hauser⁹⁴, D. Henrichs⁹⁵, S. T. Hodgson⁹⁶, H. E. Hoare⁹⁷, A. Hunter⁹⁸, G. Jentgens⁹⁹, S. Jordan¹⁰⁰, M. Kertész¹⁰¹, A. J. Korn¹⁰², A. C. Lanzetta¹⁰³, M. Marín¹⁰⁴, A. Morbidelli¹⁰⁵, K. Moutou¹⁰⁶, J. Oudiz¹⁰⁷, E. Pancino¹⁰⁸, T. Parmentier¹⁰⁹, J.-M. Pout¹¹⁰, A. Roca-Blanco¹¹¹, A. C. Robin¹¹², L. M. Sarajedini¹¹³, M. Smith¹¹⁴, K. W. Smith¹¹⁵, A. Sozzani¹¹⁶, W. Thuillard¹¹⁷, W. van Rossum¹¹⁸, Y. Vaisis¹¹⁹, U. Abbas¹²⁰, A. Abreu Aranzaburu¹²¹, S. Accardi¹²², J. J. Agranovich¹²³, P.-M. Aillard¹²⁴, W. Allart¹²⁵, G. Alvarado¹²⁶, M. A. Alvarez¹²⁷, R. I. Anderson¹²⁸, A. H. Andersen^{129,130}, J. E. Anglada-Escorial¹³¹, E. Arcturiz¹³², E. Arcturiz¹³³, A. Amajía¹³⁴, S. Antier¹³⁵, N. Bast¹³⁶, S. G. Bates¹³⁷, I. Beldarraín-Núñez¹³⁸, C. Baran¹³⁹, C. Baran¹⁴⁰, A. Barba¹⁴¹, P. Barba¹⁴², D. Baran¹⁴³, V. Nessouci¹⁴⁴, M. Barua¹⁴⁵, M. A. Barua¹⁴⁶, U. Becchini¹⁴⁷, M. Bellazzini¹⁴⁸, A. Bello-García¹⁴⁹, V. Blotnikov¹⁵⁰, P. Borduas¹⁵¹, A. Borraerts¹⁵², L. Branchini¹⁵³, O. Broeg¹⁵⁴, P. Biller¹⁵⁵, N. Bugarin¹⁵⁶, S. Blanco-Cruces¹⁵⁷, T. Buch¹⁵⁸, A. Borrone¹⁵⁹, R. Brusa¹⁶⁰, S. Brusa¹⁶¹, S. Brusa¹⁶², H. Bruntt¹⁶³, A. Brucato¹⁶⁴, M. A. Brucato¹⁶⁵, N. Brucato¹⁶⁶, T. Brucato¹⁶⁷, T. Brucato¹⁶⁸, P. Buzza¹⁶⁹, R. Buzza¹⁷⁰, A. Buzza¹⁷¹, D. Busonero¹⁷², R. Buzzo¹⁷³, E. Caffau¹⁷⁴, J. Cantarel¹⁷⁵, H. Campbell¹⁷⁶, A. Cassinelli¹⁷⁷, T. Cantat-Gaudin¹⁷⁸, T. Cariani¹⁷⁹, J. M. Carrasco¹⁸⁰, M. Cassiani¹⁸¹, P. Charlier¹⁸², J. Charrier¹⁸³, A. Chavava¹⁸⁴, M. Cifuentes¹⁸⁵, G. Cocuzza¹⁸⁶, R. S. Collins¹⁸⁷, G. Coniglari¹⁸⁸, P. David¹⁸⁹, N. J. G. Cross¹⁹⁰, M. Costa¹⁹¹, C. Crowley¹⁹², C. D'Amico¹⁹³, A. Diaperola¹⁹⁴, P. Diari¹⁹⁵, V. Diari¹⁹⁶, P. De Cam¹⁹⁷, F. de Felip¹⁹⁸, P. de Laverny¹⁹⁹, P. de Lisle²⁰⁰, P. de March²⁰¹, D. de Martin²⁰², R. de Souza²⁰³, J. Debochev²⁰⁴, E. del Pozo²⁰⁵, M. Debo²⁰⁶, A. Delgado²⁰⁷, H. De Laja²⁰⁸, D. De Laja²⁰⁹, M. De Laja²¹⁰, E. Di Stefano²¹¹, C. Dilling²¹², S. Dos Anjos²¹³, P. Drazinos²¹⁴, J. Drazinos²¹⁵, Y. Drazinos²¹⁶, B. Edelroth²¹⁷, H. Edelroth²¹⁸, N. W. Evans²¹⁹, G. Eymard-Bertrand²²⁰, C. Fama²²¹, M. Fabrigar²²², S. Fagier²²³, J. Falcão²²⁴, M. Faria Gasar²²⁵, I. Fariñas²²⁶, G. Fedorov²²⁷, J. Fernández-Hernández²²⁸, P. Ferragut²²⁹, A. Férug²³⁰, P. Figuera²³¹, P. Filippini²³², K. Findeisen²³³, A. Finni²³⁴, M. Fontana²³⁵, E. Frick²³⁶, M. Fuser²³⁷, J. Fuchs²³⁸, M. Ciel²³⁹, S. Gilless²⁴⁰, L. Gilman²⁴¹, D. Girardot²⁴², F. García-Solano²⁴³, A. García-Valenzuela²⁴⁴, N. Garrido²⁴⁵, P. Gavras^{246,148}, J. Gerssen²⁴⁷, R. Geyer²⁴⁸, G. Gilless²⁴⁹, S. Girardot²⁵⁰, G. Gilman²⁵¹, M. Gómez²⁵², A. González-Marcos²⁵³, J. González-Núñez²⁵⁴, J. González-Vidal²⁵⁵, M. Granica²⁵⁶, A. Guermat²⁵⁷, P. Guillou²⁵⁸, J. Guiraud²⁵⁹, A. Gáspari²⁶⁰, R. Gutiérrez-Albeniz²⁶¹, L. P. Gray²⁶², R. Haigmos²⁶³, D. Hernández²⁶⁴, M. Haywood²⁶⁵, U. Heiter²⁶⁶, A. Helmi²⁶⁷, D. Hogg²⁶⁸, W. Hofmann²⁶⁹, B. Holl²⁷⁰, G. Holland²⁷¹, J. A.S. Hatt²⁷², A. Hyvärinen²⁷³, V. Ianni²⁷⁴, M. Ianni²⁷⁵, G. Jevanlika-Foulkrie²⁷⁶, P. Jofre²⁷⁷, P. G. Jofre²⁷⁸, A. Kanaan²⁷⁹, J. Jaber²⁸⁰, A. Karampini²⁸¹, A. Kerkhove²⁸², K. Kerschbaum²⁸³, E. Kontarinos²⁸⁴, S. E. Koponen²⁸⁵, G. Koutoumpas²⁸⁶, P. Kozlowski²⁸⁷, A. Kozłowski²⁸⁸, M. Kudrykshova²⁸⁹, J. Kull²⁹⁰, R. K. Bachman²⁹¹, F. Launus-Saari²⁹², A. P. Lahaie²⁹³, J. J. Laskar²⁹⁴, C. La Parola-Ludlow²⁹⁵, V. Lohman²⁹⁶, T. Lohman²⁹⁷, S. Luzzati²⁹⁸, N. Lütken²⁹⁹, J. Luceas-Talbot³⁰⁰, V. Lemasu³⁰¹, H. Lénkaš³⁰², F. Lemasu³⁰³, S. Liao³⁰⁴, E. Licaur³⁰⁵, H. E.P. Lindqvist³⁰⁶, T. A. Lister³⁰⁷, A. Liotto³⁰⁸, V. Löffler³⁰⁹, M. López³¹⁰, D. Lemasu³¹¹, J. Macdonald³¹², T. Magalhães-Fernandes³¹³, S. Marín³¹⁴, R. G. Mason³¹⁵, G. Mantino³¹⁶, O. Marchal³¹⁷, J. M. Marchant³¹⁸, M. Marconi³¹⁹, S. Marín³²⁰, P. M. Marín³²¹, G. Marchetti³²², D. J. Marshall³²³, J. M. Martín-Fleitas³²⁴, M. Martín³²⁵, N. May³²⁶, G. Mayor³²⁷, J. Mazou³²⁸, P. J. McMillan³²⁹, D. J. Meakin³³⁰

* Corresponding author: A. G. Bailer-Jones, email: baillier@eso.org

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**Astronomy
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Special issue

D. Michalik¹³, N. R. Miller¹⁴, B. M. H. Minniti¹⁵, D. Molino¹⁶, R. Molino¹⁷, M. Molino¹⁸, L. Molde¹⁹, M. Monari²⁰, P. Montegriffo²¹, R. Mor²², A. Mosser²³, R. Mordehai²⁴, T. Morel²⁵, S. Murgathaler²⁶, D. Morini²⁷, A. E. Muñoz²⁸, E. Muraveva²⁹, J. Musella³⁰, J. Narbonne³¹, G. Néménis³², L. Nelan³³, L. Nono³⁴, C. Orlowski³⁵, J. Orlowski³⁶, P. Osburn³⁷, C. Pagani³⁸, I. Pagani³⁹, J. Pallarés⁴⁰, H. Palacios⁴¹, L. Palermi⁴², P. Parsons⁴³, M. Pasetti⁴⁴, R. Pechini⁴⁵, H. Pechini⁴⁶, D. Segarra⁴⁷, I. C. Sillio⁴⁸, R. Smeigman⁴⁹, R. L. Smart⁵⁰, E. Slezacek⁵¹, F. Sillari⁵², R. Smal⁵³, S. Sota-Nog⁵⁴, J. Soubra⁵⁵, A. Spina⁵⁶, F. Spoto⁵⁷, U. Stassun⁵⁸, M. Ramos-Lerate⁵⁹, P. Rastelli⁶⁰, G. Rauw⁶¹, A. Raza⁶², S. Rejkoubi⁶³, C. Rey⁶⁴, R. A. Ribeiro⁶⁵, I. Rimoldini⁶⁶, V. Rippey⁶⁷, A. Riva⁶⁸, G. Rizzi⁶⁹, M. Roesler⁷⁰, M. Romero-Gómez⁷¹, N. Rowell⁷², F. Royer⁷³, L. Ruiz-Derr⁷⁴, G. Sadowski⁷⁵, T. Sagrini Sola⁷⁶, J. Sahlmann⁷⁷, J. Salgado⁷⁸, E. Salgado⁷⁹, M. Sarason⁸⁰, H. Sartoretti⁸¹, M. Schulz⁸², E. Scienza⁸³, M. Segol⁸⁴, J. C. Serrano⁸⁵, D. Segura⁸⁶, J. C. Sillio⁸⁷, R. Smeigman⁸⁸, R. L. Smart⁸⁹, E. Slezacek⁹⁰, F. Sillari⁹¹, R. Smal⁹², S. Sota-Nog⁹³, J. Soubra⁹⁴, A. Spina⁹⁵, F. Spoto⁹⁶, U. Stassun⁹⁷, I. A. Steele⁹⁸, H. Strelitz-Reed⁹⁹, C. A. Stephens¹⁰⁰, H. Stoe¹⁰¹, F. F. Sauer¹⁰², M. Storz¹⁰³, J. Sunko¹⁰⁴, I. Szabados¹⁰⁵, E. Szeged-Hazi¹⁰⁶, D. Tapia¹⁰⁷, P. Taira¹⁰⁸, G. Taurasi¹⁰⁹, M. B. Taylor¹¹⁰, R. Teodoro¹¹¹, D. Tisserand¹¹², B. Tjapaa¹¹³, S. C. Trager¹¹⁴, G. Tzanou¹¹⁵, A. Uda¹¹⁶, E. Utrilla¹¹⁷, G. Valentin¹¹⁸, A. van Eylen¹¹⁹, E. Van Herckel¹²⁰, M. van Leeuwen¹²¹, M. Vanden¹²², A. Vicedomini¹²³, J. Veljanovski¹²⁴, T. Vais¹²⁵, D. Vicente¹²⁶, S. Vogt¹²⁷, H. Voss¹²⁸, V. Votaw¹²⁹, S. Wozniak¹³⁰, G. Włochowicz¹³¹, M. Wozniak¹³², K. Wozniak¹³³, F. Wozniak¹³⁴, E. Wyrzykowski¹³⁵, A. Yolda¹³⁶, A. Yolda¹³⁷, S. Zariwala¹³⁸, C. Zecher¹³⁹, A. Azeved¹⁴⁰, M. Allen¹⁴¹, C. Allende Prieto^{142,143}, A. Amorim¹⁴⁴, G. Anglada-Escorial¹⁴⁵, V. Anorjan¹⁴⁶, S. Anzi¹⁴⁷, P. Balin¹⁴⁸, M. Beck¹⁴⁹, H.-H. Bannister¹⁵⁰, L. Bargez¹⁵¹, A. Bijaoui¹⁵², C. Blanco¹⁵³, M. Bond¹⁵⁴, G. Brusa¹⁵⁵, S. Brusa¹⁵⁶, S. Brusa¹⁵⁷, A. Brusa¹⁵⁸, S. Brown¹⁵⁹, P.-M. Brusa¹⁶⁰, P. Brusa¹⁶¹, R. Brusa¹⁶², A. G. Bruckert¹⁶³, C. Carst¹⁶⁴, C. Carst¹⁶⁵, I. Chems¹⁶⁶, F. Chems¹⁶⁷, J. Corcione¹⁶⁸, E. Dammery¹⁶⁹, X. S. de Boer¹⁷⁰, P. de Toledano¹⁷¹, F. J. de Zeeuw¹⁷², C. Della Luchetta¹⁷³, C. D. Dominguez¹⁷⁴, P. Dubois¹⁷⁵, F. Fodor¹⁷⁶, B. Friauf¹⁷⁷, A. Friauf¹⁷⁸, D. Friauf¹⁷⁹, D. Pygall¹⁸⁰, E. Gallardo¹⁸¹, J. Gallardo¹⁸², D. Gerssen¹⁸³, M. Gebran¹⁸⁴, A. Gómez¹⁸⁵, A. Gómez¹⁸⁶, A. Gómez¹⁸⁷, A. Gómez¹⁸⁸, A. Gómez¹⁸⁹, A. Gómez¹⁹⁰, A. Gómez¹⁹¹, A. Gómez¹⁹², A. Gómez¹⁹³, A. Gómez¹⁹⁴, A. Gómez¹⁹⁵, A. Gómez¹⁹⁶, A. Gómez¹⁹⁷, A. Gómez¹⁹⁸, A. Gómez¹⁹⁹, A. Gómez²⁰⁰, A. Gómez²⁰¹, A. Gómez²⁰², A. Gómez²⁰³, A. Gómez²⁰⁴, A. Gómez²⁰⁵, A. Gómez²⁰⁶, A. Gómez²⁰⁷, A. Gómez²⁰⁸, A. Gómez²⁰⁹, A. Gómez²¹⁰, A. Gómez²¹¹, A. Gómez²¹², A. Gómez²¹³, A. Gómez²¹⁴, A. Gómez²¹⁵, A. Gómez²¹⁶, A. Gómez²¹⁷, A. Gómez²¹⁸, A. Gómez²¹⁹, A. Gómez²²⁰, A. Gómez²²¹, A. Gómez²²², A. Gómez²²³, A. Gómez²²⁴, A. Gómez²²⁵, A. Gómez²²⁶, A. Gómez²²⁷, A. Gómez²²⁸, A. Gómez²²⁹, A. Gómez²³⁰, A. Gómez²³¹, A. Gómez²³², A. Gómez²³³, A. Gómez²³⁴, A. Gómez²³⁵, A. Gómez²³⁶, A. Gómez²³⁷, A. Gómez²³⁸, A. Gómez²³⁹, A. Gómez²⁴⁰, A. Gómez²⁴¹, A. Gómez²⁴², A. Gómez²⁴³, A. Gómez²⁴⁴, A. Gómez²⁴⁵, A. Gómez²⁴⁶, A. Gómez²⁴⁷, A. Gómez²⁴⁸, A. Gómez²⁴⁹, A. Gómez²⁵⁰, A. Gómez²⁵¹, A. Gómez²⁵², A. Gómez²⁵³, A. Gómez²⁵⁴, A. Gómez²⁵⁵, A. Gómez²⁵⁶, A. Gómez²⁵⁷, A. Gómez²⁵⁸, A. Gómez²⁵⁹, A. Gómez²⁶⁰, A. Gómez²⁶¹, A. Gómez²⁶², A. Gómez²⁶³, A. Gómez²⁶⁴, A. Gómez²⁶⁵, A. Gómez²⁶⁶, A. Gómez²⁶⁷, A. Gómez²⁶⁸, A. Gómez²⁶⁹, A. Gómez²⁷⁰, A. Gómez²⁷¹, A. Gómez²⁷², A. Gómez²⁷³, A. Gómez²⁷⁴, A. Gómez²⁷⁵, A. Gómez²⁷⁶, A. Gómez²⁷⁷, A. Gómez²⁷⁸, A. Gómez²⁷⁹, A. Gómez²⁸⁰, A. Gómez²⁸¹, A. Gómez²⁸², A. Gómez²⁸³, A. Gómez²⁸⁴, A. Gómez²⁸⁵, A. Gómez²⁸⁶, A. Gómez²⁸⁷, A. Gómez²⁸⁸, A. Gómez²⁸⁹, A. Gómez²⁹⁰, A. Gómez²⁹¹, A. Gómez²⁹², A. Gómez²⁹³, A. Gómez²⁹⁴, A. Gómez²⁹⁵, A. Gómez²⁹⁶, A. Gómez²⁹⁷, A. Gómez²⁹⁸, A. Gómez²⁹⁹, A. Gómez³⁰⁰, A. Gómez³⁰¹, A. Gómez³⁰², A. Gómez³⁰³, A. Gómez³⁰⁴, A. Gómez³⁰⁵, A. Gómez³⁰⁶, A. Gómez³⁰⁷, A. Gómez³⁰⁸, A. Gómez³⁰⁹, A. Gómez³¹⁰, A. Gómez³¹¹, A. Gómez³¹², A. Gómez³¹³, A. Gómez³¹⁴, A. Gómez³¹⁵, A. Gómez³¹⁶, A. Gómez³¹⁷, A. Gómez³¹⁸, A. Gómez³¹⁹, A. Gómez³²⁰, A. Gómez³²¹, A. Gómez³²², A. Gómez³²³, A. Gómez³²⁴, A. Gómez³²⁵, A. Gómez³²⁶, A. Gómez³²⁷, A. Gómez³²⁸, A. Gómez³²⁹, A. Gómez³³⁰, M. L. Wilkinson³³¹, H. Zwaan³³², and S. Zuckerman³³³

(Affiliations can be found after the references)

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ABSTRACT

Context. At launch (2016) Gaia is the largest of the Gaia Data Release 1 (DR1) containing all astrometry and photometry for over 1 billion sources brighter than magnitude 20.5.

Abstract. This paper presents the summary of the scientific quality of the data, including a description of the limitations due to the preliminary nature of this release.

Methods. The data were obtained by Gaia during the first 14 months of the mission but were processed by the Gaia Data Processing and Analysis Consortium (DPAC) and stored into an astrometric and photometric catalogue.

Results. The DR1 consists of three components: a primary catalogue of data which contains the positions, parallaxes, and mean proper motions for about 2 million of the brightest stars in common with the Hipparcos and Tycho-2 catalogues – a sub-catalogue of the Tycho-Gaia Astrometric Solution (TGAS) – and a secondary astrometric data set containing the positions for an additional 1.1 billion sources. The second component is the photometric data set, consisting of three G-band magnitude for all sources. The G-band light curves and the characteristics of ~ 5000 Cepheids and RR Lyrae stars, observed at a light cadence across the whole stellar population, form the third component. For the primary astrometric data set the typical uncertainty is about 0.3 mas for the positions and parallaxes, and about 1 mas yr⁻¹ for the proper motions. A systematic component of ~ 0.3 mas should be added for the stellar parallaxes. For the subset of ~ 100 000 stars in the primary data set, the proper motions are much more precise at about 0.08 mas yr⁻¹. For the secondary astrometric data set, the typical uncertainty of the position is ~ 0.3 mas. The median uncertainties for the mean G-band magnitudes range from the range level of ~ 0.03 mag to the magnitude level of 20.7.

Conclusions. Gaia DR1 is an important milestone in the new Gaia data releases, which will further the parameter estimation for all sources. Extensive validation shows that Gaia DR1 represents a major advance in the mapping of the Galaxy and the availability of basic stellar data that underpins observational astrophysics. Nevertheless, the very preliminary nature of this Gaia data release does lead to a number of important limitations to the data quality which should be carefully considered before drawing conclusions from the data.

Key words: catalogues – astrometry – parallaxes – proper motions – surveys

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Figure 2. The many contributors to the Gaia Data Release 1.



Figure 3. Writing Studio Dreamland.

The working group chose ShareLaTeX and a prototype was built using the ShareLaTeX open-source code supported under the open-source license that it uses. All changes and revisions were published to a Github public repository. In addition Dropbox sync functionality was provided under a license agreement to make this available to all users of the writing studio.

The tool underwent rigorous user-testing, gathering feedback from editors and beta testers to help design the best solutions and features to ensure the best user experience. The ambition was for the SWS to eventually provide a simple tool not just for authoring an article, but also to be able to submit to the journal. Additionally, it was required that the A&A language editors should be able to use the tool to submit their corrections and edits.

3 Making Scientific Writing Studio different

This tool has been designed and developed specifically for authors of A&A and those writing in the disciplines of astronomy and astrophysics. Specific features were developed for the SWS, for example EDP Sciences worked closely with CDS to include a tool in SWS that automatically detects and highlights stellar objects (see Fig. 4). Login using an ORCID iD was also integrated in order to authenticate login and ensure no ambiguity over author names, which is increasingly a problem in the scholarly research community.

4 Launch

The SWS was launched at the end of 2015 and now has well over 600 accounts with nearly 800 articles having been worked on. The Editors' ambition for a collaborative tool has been achieved as

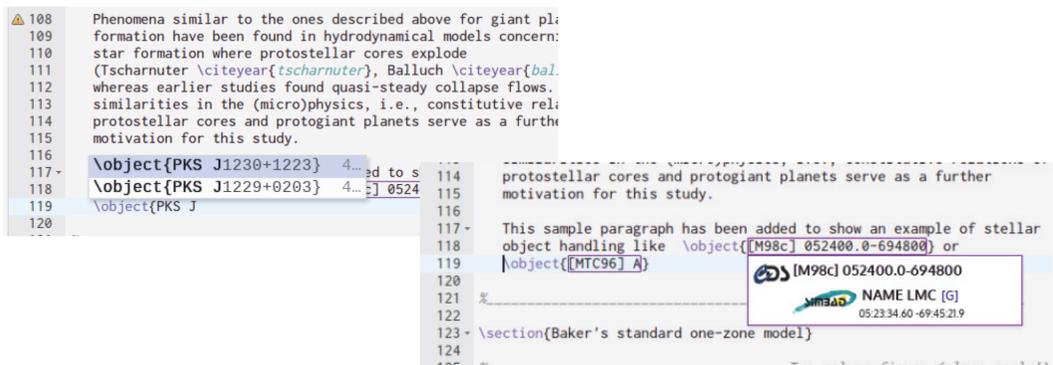


Figure 4. Links to stellar objects.

Table 1. Some numbers

	May 17	August 16
Number of active accounts (connected at least once):	511	323
Number of projects (total):	738	355
Projects with at least one declared collaborator:	170	70
Maximum number of collaborators on a project:	16 (1 project)	8
Number of files with more than 100 modifications:	332	92
Chats around the projects:	208	103

up to 16 authors at a time have been working on a single paper, and nearly 200 with more than one collaborator! (Table 1).

5 Overview of capabilities

The **SWS** has been developed to allow authors to spend less time with LaTeX and process, and more time on presenting and defending their science in collaboration with their co-authors. Today, the **SWS** offers authors the following benefits:

- A collaborative LaTeX solution: Author and co-authors can work on a unique version of the paper with A&A macros already included.
- Easier links to stellar objects: Authors get auto-completion for stellar objects and additional information using tools developed with the CDS.
- Chat with co-authors: Authors are able to ask questions and chat with co-authors for direct communication.
- Dropbox integration: Articles can be edited offline and are automatically synchronized with the Dropbox online copy.
- ORCID integration: allows ease of login recognition to Writing Studio.
- Ease of Submission: automatic upload of article to submission system, with key fields pre-filled ready for checking.

All of these means **SWS**, provides a stronger bond between the journal and the author by making the writing of their articles easier, and that means they want to come back to the journal with the results of their research in the future (Fig. 5).

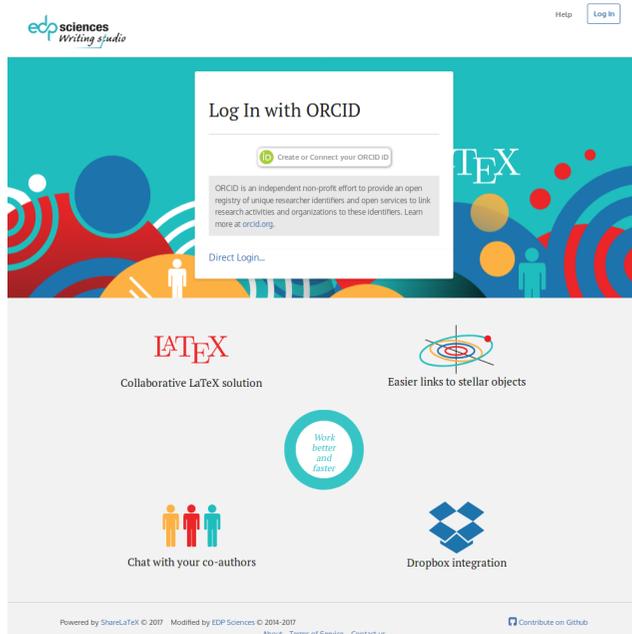


Figure 5. Login page for the Scientific Writing Studio.

6 Future Developments

Next steps are to:

- Integrate a citation helper to make building reference lists easy for the end user.
- The ability for an author to import from their ADS library papers they have bookmarked.
- Develop a comprehensive user guide.

7 Conclusion

By understanding the needs of researchers in a particular discipline, and working closely with the associated organisations in that field, as well as understanding the publishing process and services and tools to support publication, Publishers can assist authors to present their science in collaboration with their co-authors in an efficient way leaving more time for their research.

The SWS is bringing A&A closer to their goal of a fully integrated and user-friendly workflow from writing through to submission and dissemination of an article (Fig.6).

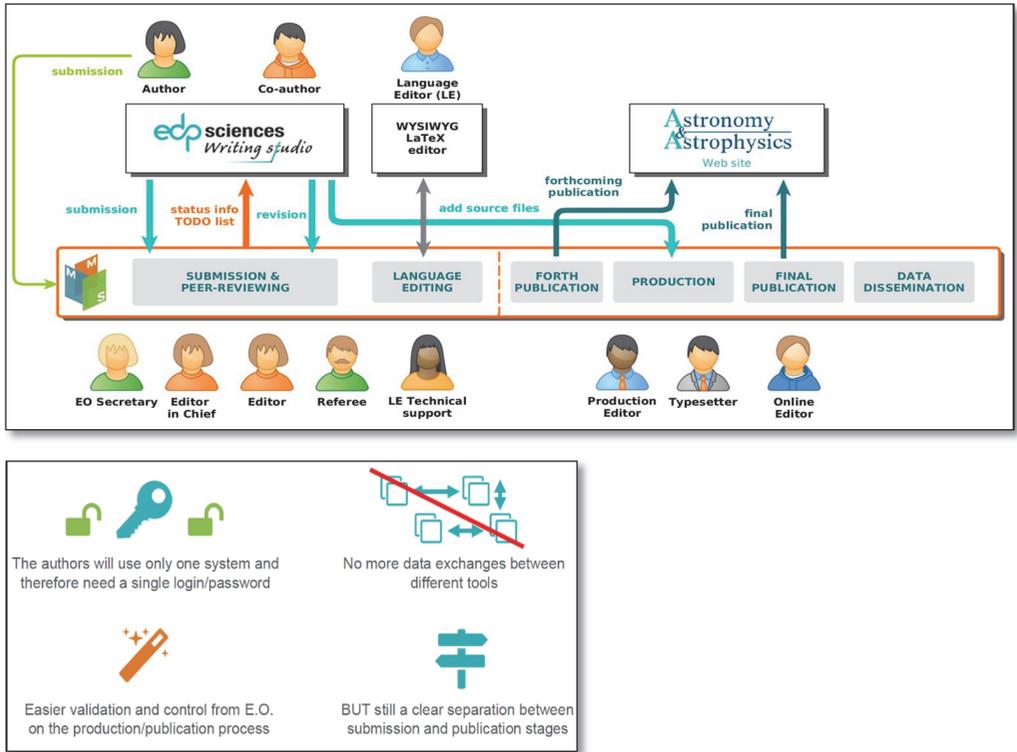


Figure 6. A&A workflow.