

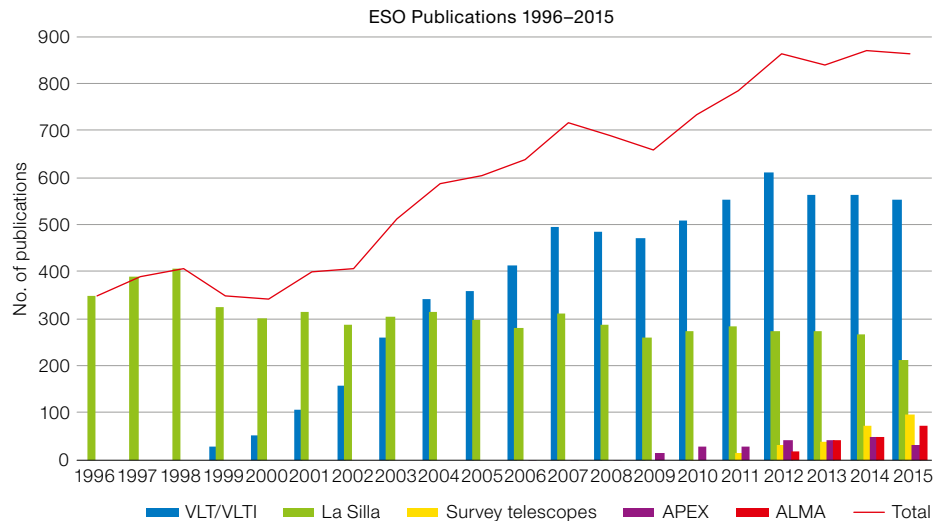
Publication Digest

By the end of 2015, the ESO telescope bibliography (*telbib*) contained almost exactly 12 000 papers that use data from ESO's observing facilities and have appeared in refereed journals since 1996. In 2015 alone, 860 of these articles were published, making this year the third most productive in terms of refereed papers in the history of ESO.

The number of papers resulting from the individual observing sites, as well as the total number per year are shown in the figure to the right. An overview of the publication statistics is available on a dedicated webpage at telbib.eso.org/pubstats_overview.php, including links to the corresponding records in the *telbib* database.

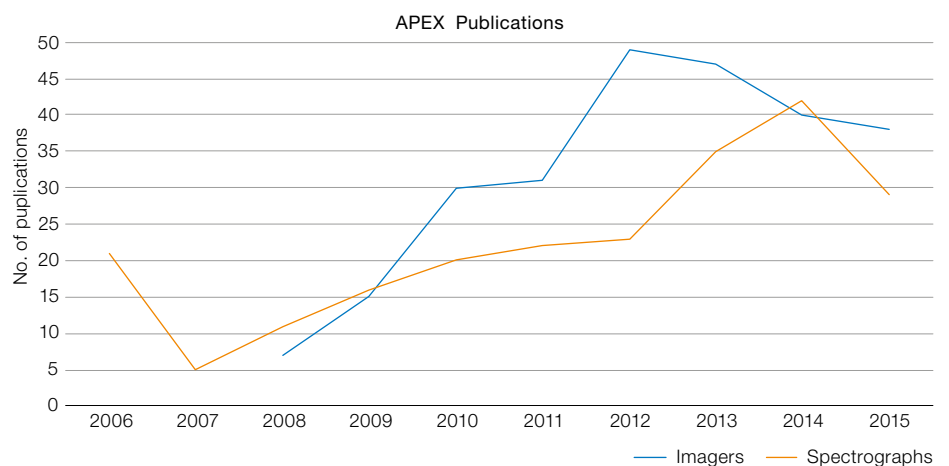
The VLT and VLTI provided data for 550 refereed papers in 2015. This number is similar to those recorded for previous years and might suggest that a plateau regarding VLT/VLTI papers has been reached. X-shooter, the first of the second generation instruments, is still increasing its productivity, generating a large number of papers (78) in its sixth year of operation. The new planet-finder instrument, SPHERE, has produced its first papers, immediately leading to the impressive number of 16 in 2015. As in previous years, UVES and FORS2 were the most productive instruments in 2015 with 144 and 91 papers, respectively. Further statistics relating to the individual instruments can be found in the *Basic ESO Publication Statistics* report.

After many years of operation, La Silla also continues to be a steady producer of data that lead to scientific publications. More than 200 papers used data that was either exclusively or partly from facilities located at this site. Once again, HARPS, mounted at the ESO 3.6-metre telescope, has shown an extraordinary performance in 2015 by producing over 80 papers. The ESO Faint Object Spectrograph and Camera 2 (EFOSC2), an instrument that was originally installed at the NTT and later transferred to the MPG/ESO 2.2-metre and then to the ESO 3.6-metre telescope, and is now once again mounted at the NTT, has provided observations that resulted in almost 50 papers in the past year.



Refereed papers using ESO data, 1996–2015. Papers can use data from more than one facility. VLT/VLTI: Papers using data generated by VLT and VLTI instruments, including visitor instruments for which observing time is recommended by the ESO OPC, for example, VLT ULTRACAM, VLTI PIONIER. La Silla: Papers using data generated by facilities on La Silla, including visitor instruments for which observing time is recommended by the OPC, for example, NTT ULTRACAM. Papers based on data from non-ESO telescopes or observations obtained during reserved periods (for example, national allocations of time) are not included.

Survey telescopes: Papers using data generated by ESO's survey telescopes VISTA and VST. APEX: Papers using data generated by APEX, including visitor instruments for which observing time is recommended by the OPC, for example, Z-Spec. Only papers based (entirely or partly) on ESO APEX time are included. ALMA: Papers using data generated by ALMA. Only papers based (entirely or partly) on ESO ALMA time are included.



Number of refereed publications per year produced using APEX imagers and spectrographs. Data are from observations by all APEX partners.

Note that non-ESO telescopes (for instance the Swiss 1.2-metre Leonhard Euler Telescope) and other facilities located on La Silla, for which observing time is not evaluated by the Observing Programmes Committee (OPC), are not included in the ESO statistics. It is

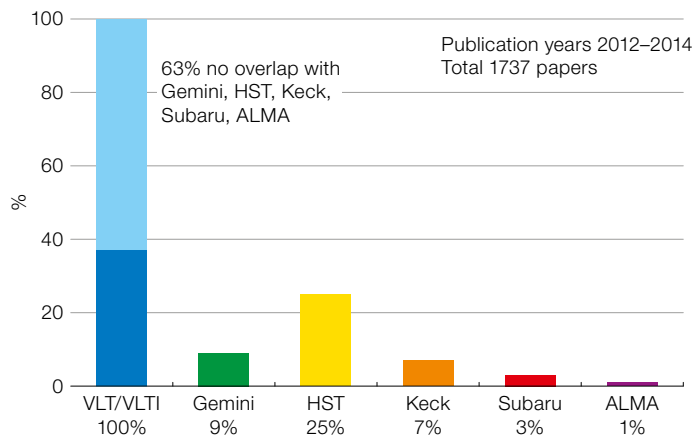
impressive that the FEROS spectrograph and the Wide Field Imager (WFI) still achieve a noteworthy number of papers (40 and 26, respectively, in 2015) even though these instruments have not been operating under ESO time since October 2013.

The ESO survey telescopes, VISTA and the VST, have increased their production of papers remarkably in 2015 (73 and

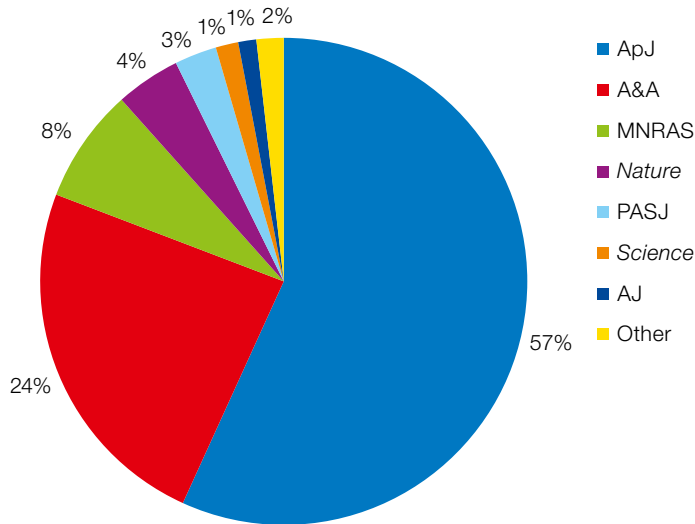
24 refereed publications, respectively). The vast majority of VISTA papers (93%, i.e., 68 out of 73 papers) were based on data from one of the six Public Surveys carried out at this telescope. The number of papers using data from the VST has tripled in 2015 in comparison with the previous year.

Data from the APEX telescope (all partners) led to 63 papers in 2015, bringing the total number of papers using APEX data to 451 by the end of the year. More than half of the 2015 papers used ESO observing time: 32 out of 63 in 2015 (51%), and 253 out of 451 papers for all years (56%). Since the first publication in 2006, the APEX imagers (APEX-SZ, LABOCA [the Large APEX Bolometer Camera], P-ArTeMiS [Prototype Architectures de Bolometres pour des Telescopes a grand champ de vue dans la domaine sub-Millimetrique au Sol], SABOCA [Sub-millimetre APEX Bolometer Camera]) and spectrographs (APEX-2A, CHAMP+ [Carbon Heterodyne Array of the Max Planck Institute for Radio Astronomy (MPIfR)], CONDOR [CO N⁺ Deuterium Observations Receiver], FLASH [First Light APEX Submillimetre Heterodyne receiver], MPI 1.1 THz, SHFI [Swedish Heterodyne Facility Instrument], Z-Spec millimetre-wave spectrograph and the Redshift (z) Early Universe Spectrometer [ZEUS]) have led to almost the same number of papers (spectrographs: 228, imagers: 256). The distribution of publications per year is shown in the lower figure on the previous page.

Overlap of VLT/VLTI proprietary and archival data with papers using Gemini, HST, Keck, Subaru or ALMA data in refereed articles for publications in the years 2012–2014.



ALMA publications: Journals



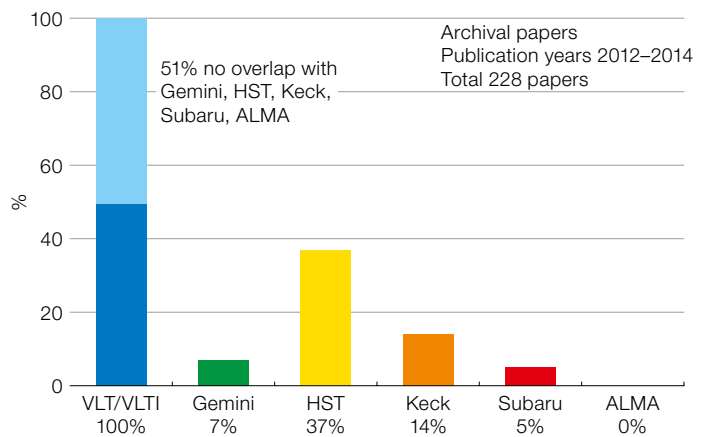
Journal distribution of ALMA papers, 2012–2015. Data are from observations by all ALMA partners.

ALMA has seen a large increase in paper productivity in 2015. In comparison with the previous year, the number of papers based on ESO ALMA time, as well as the papers resulting from the observing time assigned to all ALMA partners, has increased by approximately 55%, namely from 47 papers in 2014 to 73 in 2015 for ESO ALMA time, and from 97 to 147 for all ALMA partners. The total number of ALMA papers was 328 by the end of the year. As shown in the figure above, 57% of these publications appeared in ApJ, 24% in A&A, and 8% in MNRAS. *Nature* and *Science* papers account for 4% and 1%, respectively.

The ALMA bibliography is maintained jointly by the librarians at ESO and the National Radio Astronomy Observatory (NRAO) in the USA as well as by the National Astronomical Observatory of Japan (NAOJ). Publications based on data from all ALMA partners are recorded in *telbib*, but only those based on European observing time are counted in the ESO statistics.

The ESO Science Archive continues to be an important facility for the ESO user community. In 2015, 21% of the VLT/VLTI papers (118 out of 550) used partly or exclusively archival data. More than 6%

Overlap of VLT/VLTI archival-only data with papers using Gemini, HST, Keck, Subaru, or ALMA data for refereed articles in years 2012–2014.



(34 out of 550) of all VLT/VLTI papers employed Science Data Products, i.e., pre-reduced data provided by the Science Archive Facility; this fraction corresponds to almost 29% of all papers that used archival data (34 out of 118).

It is not uncommon for VLT/VLTI data to be complemented in scientific papers by data from other large facilities, for instance in publications that deal with multi-wavelength studies. The ESO Library carried out a study for the publication years 2012–2014 to investigate the overlap of VLT/VLTI papers with those that use Gemini, HST, Keck, Subaru, or ALMA data. (The bibcodes of papers that use Gemini, HST, Keck, and Subaru data were obtained from the Astronomical Data System by selecting the respective filters. ALMA bibcodes for all ALMA partner publications are available in *telbib*.) The total number of VLT/VLTI papers published during these years was 1737. It was found that 9%, 7% and 3% of these papers also used Gemini, Keck, and Subaru data, respectively. The largest overlap, however, was found with HST papers: 25% of the publications included in this study used both VLT/VLTI and HST data. With 2012 being the first

year of ALMA papers, 1% of the ALMA papers published from 2012 to 2014 also discussed VLT/VLTI observations. Some of these papers might even use data from more than one other facility. In contrast, the study also revealed that 63% of the VLT/VLTI papers did not have any overlap with Gemini, HST, Keck, Subaru, or ALMA.

Interestingly, this trend is even more pronounced in papers that use exclusively archival VLT/VLTI data, i.e., observations for which none of the authors were among the team of observers. For this set of papers (total number 228), the overlap with HST papers rises to a remarkable 37%. Also Keck and Subaru share a higher percentage with VLT/VLTI archive-only papers (14% instead of previously 7% for Keck, 5% instead of 3% for Subaru papers), while the percentage of papers shared with Gemini declines slightly (from 9% to 7%). Due to the low number of publications that use both VLT/VLTI and ALMA data, there are no papers in common when only archival VLT/VLTI data papers are taken into account (see lower plots on the previous page). Only 51% of the archival VLT/VLTI papers do not use any Gemini, HST, Keck, Subaru, or ALMA data.

The statistics presented here are derived from the ESO Telescope Bibliography (*telbib*), a database of refereed papers published by the ESO user community that links publications with the data in the ESO Science Archive. *telbib* is developed and maintained by the ESO Library. It is compiled by scanning articles published in the major astronomical journals for ESO-related keywords (for example, telescope and instrument names). Journals routinely screened for ESO-related keywords are: A&A, A&ARv, AJ, ApJ, ApJS, AN, ARA&A, EM&P, ExA, Icar, MNRAS, *Nature*, NewA, NewAR, PASJ, PASP, P&SS and *Science*. All papers included in the database have been inspected visually by the curators to ensure that they directly use ESO observational data. Further information about *telbib* and various statistics and reports can be found on the web (www.eso.org/sci/libraries/telbib_info.html).

The complete list of all 2015 papers is available at www.eso.org/libraries/telbib_info/AR/ESO_AnnualReport_publications2015.pdf. The file includes papers written by the ESO user community based on data generated by ESO facilities, followed by a separate listing of refereed publications by ESO scientists with or without use of ESO data.



View of the library at ESO Headquarters in Garching.