



JUMPING JIVE

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Final report on attracting new users for the EVN

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Appendix



1 Executive summary

This report is the final deliverable for JUMPING JIVE WP2, the work package aimed at outreach and advocacy for JIVE and the EVN. By their nature, outreach activities frequently exceeded the scope of the JUMPING JIVE project. Therefore, this document also includes activities that are closely related and have a direct impact on the WP2 goal of attracting new users for the EVN.

An overview of all the outreach activities developed in WP2 and other work-packages that relate to the goal of this WP is included in this report. Not all activities are described in detail, a complete list can be found in the Appendix. The materials and experience resulting from this work will be included in the continued development and dissemination of the JJ results.

As the visibility of JIVE and the EVN is important to attract new users, the efforts focused strongly on branding the organizations in the astronomical community, using a simple slogan and well-designed, recognizable materials. During conferences the scientific opportunities offered by the EVN and the role of JIVE as a supporting institute were highlighted, using the brochure, booth and other materials.

The WP2 work has established a solid basis for outreach within JIVE, which directly benefits the institute as well as the visibility of the EVN. Dedicated training events from in-house to the fantastic work done in Africa are laying the basis for a future generation of scientists for whom VLBI is an accessible observational technique in their scientific toolbox.

2 Introduction

The JUMPING JIVE work package 2 (WP2) is dedicated to outreach and advocacy for JIVE and the EVN and works towards attracting new users and increasing global visibility of the EVN instrument and services of JIVE. This report describes new work done since May 2018 (since deliverable 2.3) and gives an overview of all the related activities over the entire project period.

In the “Report on advocating the EVN” (deliverable 2.3), it is explained how WP2 relates to the other work packages and the overarching goals of the project. We have defined the framework within which the outreach activities take place, the development of materials, and the first experiences with these materials in scientific meetings.

Important lessons were learned from these first experiences and absorbed in our approach to being represented at meetings. The foundations for an EVN outreach strategy were laid, and we drafted a first version of a JIVE Outreach Strategy.



The work in JJ has been essential for JIVE and the EVN, as it helped to generate a more professional and very recognizable brand. This has been, and continues to be, exploited also at events that are not related to JJ. A comprehensive approach to outreach and advocacy for JIVE and the EVN now has a solid base, on which we can expand in the coming years.

3 Organization of outreach in JIVE

Within JIVE the key persons for the work related to WP2 are the JUMPING JIVE Science Communication Officer (SciCom) and the WP2 lead (in that order of priority). Additional resources needed for outreach activities were coordinated in the JIVE Outreach Team (JOT), which included the JJ Project Lead and JJ Project Manager, as well as one or more persons for additional support when needed.

The main purpose of the JOT was the coordination of all outreach related efforts in JIVE. The JOT ensured that the new materials and experiences from JJ were disseminated within JIVE, and improved the dissemination of JIVE and EVN results. The JOT was very successful in ensuring that information would flow from the people involved in events to the people coordinating the outreach, it also helped to set priorities and optimize the use of limited resources. Due to its success, the JOT slowly became superfluous as work-flows were established and integrated into the daily operations in JIVE. In the spring of 2019, the JOT was discontinued.

The original SciCom Officer's contract ended in January 2021. A new SciCom Officer was hired and started at JIVE on 1 May 2021. Due to extended maternity leave prior to the end of the contract, JIVE was without an active SciCom Officer for a full year, right during the pandemic. The institute related outreach activities moved back to the people involved prior to the JJ project, with assistance from a JIVE support scientist. The WP2 lead focused on organizing and participating in external activities. With the new SciCom Officer in place, the JOT will be revived, but with a lower cadence (once per two weeks) and smaller membership.

One of the main successes of the original SciCom Officer was building up a network of outreach people at the EVN institutes. Due to the physically very distinct locations and often limited availability of the people involved, this was an impressive effort. The basis is still there, and we expect this network will continue to develop with the support of the new SciCom Officer.

The lack of an active SciCom Officer impacted the outreach efforts and added to the workload of other JIVE staff. Nevertheless, the core outreach activities were continued, despite the pandemic, including the organization of an in-house workshop and VLBI specific sessions in large astronomy meetings. The only event that unavoidably suffered was the development of a central communication strategy for JIVE and the EVN. This was planned through a workshop in April 2020, first in-person then online because of the pandemic. Finally, it was postponed



indefinitely. The new SciCom Officer will restart this effort, but results are not expected before the end of the project.

4 Overview of activities

In the first years of the JJ project, the focus of WP2 was on creating materials and identifying how we could maximize the exposure of JIVE and the EVN. Since deliverable 2.3 (May 2018), a significant increase in activities has taken place, and has continued even after the COVID-19 pandemic. A complete overview of all outreach and advocacy, including the work done in other WPs, is listed in the Appendix. In this section, we focus on the high-impact activities where JJ WP2 had a key role in supporting, participating and/or organizing.

4.1. Booth (D2.2)

The booth was deliverable 2.2 for the project and delivered on time in November 2018 (see Figure 1). It was delivered on time in November 2018 and saw its first major use at the EWASS 2019 in Lyon. It has also been used internally during major meetings at JIVE (e.g., the Board of Directors meetings). The booth design is closely tied to the brochure and roll-up banners, making the presence of JIVE during major meetings uniform and easily recognizable.

4.2. Astronomical conferences

To attract new users to the EVN, large astronomical conferences provide fertile soil. We aimed at the largest international meetings to advocate the EVN through booths, talks and organizing dedicated sessions and/or workshops.

EWASS, currently known as EAS

The EWASS (European Week of Astronomy and Space Science) is an annual 1-week conference of the European Astronomical Society (EAS) attracting between 1000 and 1500 astronomers from around the world, but with a strong focus on Europe. In 2020 the EWASS was renamed to EAS conference. The 2019 meeting was in-person, the 2020 and 2021 meetings are virtual. Attendance of the 2020 virtual meeting was at an all-time high of nearly 1800 participants, it made clear that diversity at large meetings is significantly enhanced when cheap virtual access is possible.

The EWASS 2019 took place in June in Lyon (France) and saw the first exposure of the JIVE booth (see Figure 1). JIVE had its own stand supported by JUMPING JIVE, and full control over the decoration, which made the result uniform and recognizable. The booth was well visited. The impact of the materials was clearly visible (see sub-section 'Additional materials'), though being located in the only air-conditioned room in the sweltering 40°C heat helped. Learning



from the previous experience, the booth was staffed only during the breaks, minimizing the number and hours of staff needed for this.



Figure 1. Booth display in the JIVE corridor (left). Booth as part of the full display, including the roll-up banners and EVN table-cloth map at EWASS2019 in Lyon (right).

The JIVE SciCom Officer gave a presentation on communicating radio astronomy to the public during the special session dedicated to outreach and education. They were also involved in organizing the special sessions on diversity and sustainability.

In 2020 and 2021 the EAS organizational structure remained unchanged. For both years JIVE organized a Special Session dedicated to VLBI, especially for non-experienced VLBI astronomers. A Special Session lasts one day, consisting of 3 blocks of 1.5 hours. Each session had a special focus on minority representation, both in the invited and contributed presentations, and in the SOC.

In 2020 the special session was organized jointly by WP2 and WP7 to advocate the use of VLBI in a wide range of science topics, and highlight the topics addressed in the vision document drafted in WP7. Advertising this special session was supported by a brochure designed using the JJ materials (see Figure 2). The session was on 28 June and had ~100 participants and good engagement in the discussion during and after the talks via the dedicated Slack channels. All the contributions were recorded and available for over 6 weeks after the meeting.

In 2021 only WP2 was responsible for the special session. It focused on the synergies with Event Horizon Telescope, a global high-frequency and high-impact VLBI effort where JIVE staff has contributed significantly, additional topics include high-energy and multi-messenger



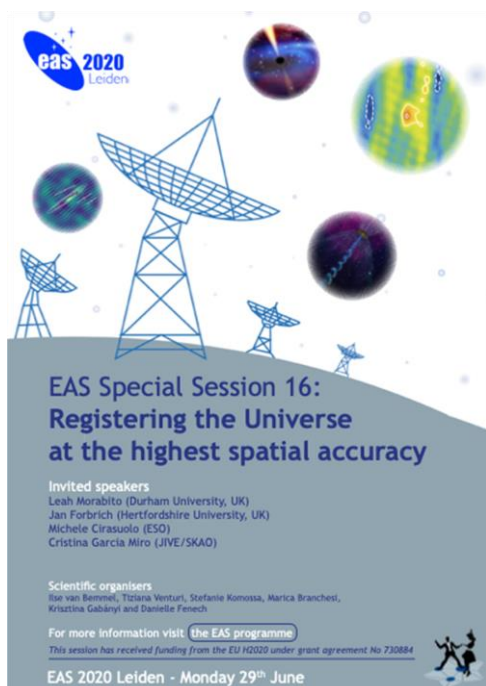


Figure 2. Brochure designed for the special session dedicated to VLBI science at the EAS2020 online meeting.

astronomy. The program was oversubscribed by a factor of 3, speakers who could not be allocated a contributed talk are given the option to present a poster, including a brief poster pitch talk. The 2021 special session took place on 29 June 2021 and reached ~50 participants.

The EAS gave the opportunity to institutes to host an online booth. Lacking sufficient resources and information on the purpose of an online booth, JIVE declined this option in 2020. In retrospect this was a good choice, as the benefits for the online booth would not have outweighed the costs. Since the setup for 2021 is similar, this year also did not see a JIVE booth. Visibility on alternative platforms such as presentations, lunch discussions and Slack requires fewer resources and is sufficient and effective.

EVN symposia and seminars

The EVN Symposium and Users' Meeting take place every 1.5 to 2 years at a location of one of the EVN institutes. They typically attract ~150 participants, most from EVN institutes and JIVE member countries. In 2018 the meeting was held in October in Granada (Spain).

In Granada, several of the JIVE and EVN roll-up banners were on display, and the brochures were handed out during this meeting. They were well received. With support from WP2, a 1-day CASA VLBI workshop was organized directly following the symposium, reaching at least a third of the participants. During the workshop, the latest developments in the CASA software to process EVN observations were demonstrated. These developments in JIVE are a key part of keeping the EVN operations up to date and accessible even for non-experienced scientists.





Figure 3. Conference picture of the EVN mini-symposium

The Users' Meeting saw a discussion about the progress of the new vision document and was advertised using the dedicated WP7 roll-up banner.

The 2020 EVN Symposium should have been in Cork (Ireland) in 2020 but was postponed due to COVID-19. In 2021 it was scaled down to a fully online mini-symposium (see Figure 3). Instead of scheduling three full days, the event consisted of 6 blocks of 2-3 hours, distributed over 3 days. In addition, a dedicated poster reception was organized during an evening. One of these blocks was committed to the Users' Meeting, the other blocks consist entirely of contributed talks, with a focus on early career and minority researchers. The meeting attracted more than 200 registered participants, of which ~100 were online at any time. In addition to Zoom, the GatherTown platform was used for the poster reception, and Discord as an online chat service for further discussion. Recordings of all the presentations are shared on YouTube (<https://www.youtube.com/c/JIVEandtheEVN/playlists>).

In addition, an EVN seminar series has been set up during COVID times, and several seminars with invited talks were scheduled around the symposium dates. The organization of the Mini-Symposium benefitted directly from the experience gained in organizing the CASA-VLBI workshop (see below).

Cartoon (WP6)

The French partners in WP6 were approached with the request to make a cartoon about the use of VLBI in geodesy (<https://www.curieux.live/2021/05/28/14035/>). The French version



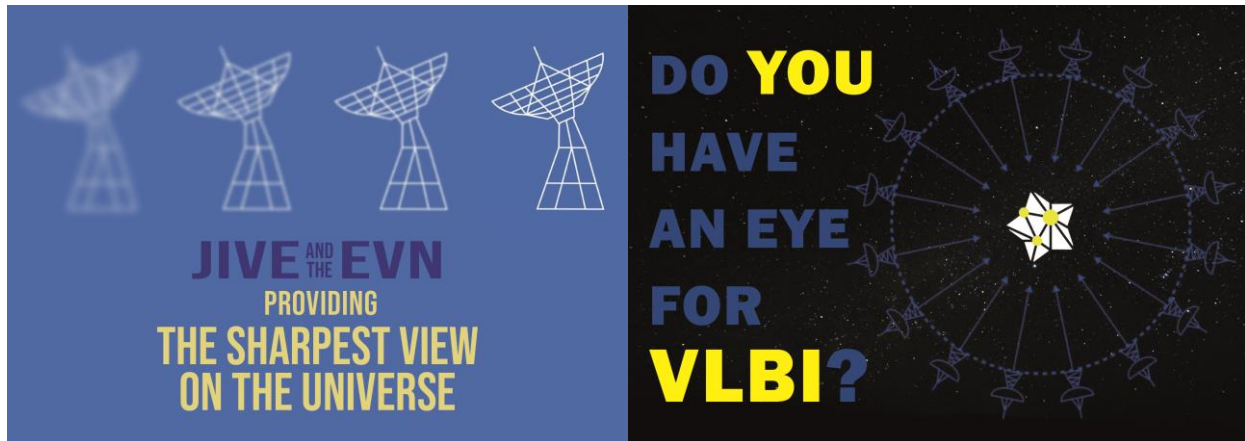


Figure 4. Two examples of the postcards designed for EWASS2019 and widely distributed at many meetings since.

has been translated into English and is undergoing final modifications. This cartoon will be part of a dedicated dissemination effort this fall, once the translation is complete.

SKA workshop (WP10)

As part of the WP10 efforts, a dedicated workshop was organized for VLBI science with the SKA in October 2019, at the SKA headquarters at Jodrell Bank (UK). The outreach surrounding this workshop was supported by WP2 and included dedicated posters and roll-up banners. Brochures and additional materials were also shared.

URSI general assembly

As part of the upcoming URSI (Union Radio-Scientifique Internationale) general assembly, JIVE is committed to organizing a session on VLBI. This will take place from 28 August – 3 September 2021 in Rome, in a hybrid (online & in-person) form. The URSI general assembly is a long-standing venue for the visibility of JIVE, but this is the first time that a dedicated VLBI session is organized as part of it.

Additional materials

In the first report (D2.3) it was noted that attracting people to a booth during a major conference can be challenging. At EWASS2018 we learned that having small hand-outs can help. A series of postcards were developed for this purpose (see Figure 4). Other materials include pens, pencils and JIVE stickers, which are highly wanted items at any meeting. The postcards have been very popular at all meetings where they have been handed out.

For large meetings, a tablecloth was printed with the global map of the EVN. It fits a 1x2m desk and comes with small coins that contain an image of actual telescopes. Visitors to the booth are encouraged to put the telescopes in the correct location on the large map. This



interactive game proves to be very popular and attracts people both during science conferences (peers) as well as during general outreach events (public).

For specific topics, A0 posters have been made to highlight the role of JIVE in a particular field. These posters follow the same design as the booth and brochure. Since they represent the latest results in science, they are quickly outdated, but also easily digitally revised and re-printed. Having a basic template for such posters has helped to produce them quickly and maintain the uniform look of the booth design.

Movie

As part of the H2020 RadioNet project, a movie was made which featured the EVN and the role of JIVE as a supporting institute for EVN observations. The original SciCom Officer contributed to this movie by providing scenes shot in JIVE and with JIVE staff, boosting the JIVE visibility within the RadioNet project and its audiences.

4.3. Educational and outreach conferences

The original SciCom Officer was very dedicated to exploring the opportunities for JIVE to be active in outreach to the general public, and education. Building up a global network of communication experts also gives visibility to JIVE in a way that has never before been exploited. This allows for easier global dissemination of JIVE related news and events, and having a SciCom Officer who is highly visible directly helps to improve the visibility of JIVE staff as well EVN institutes in news and events from other institutes.

CAP 2018

Communicating Astronomy to the Public (CAP) is a two-yearly global conference on astronomy outreach and education. The original SciCom Officer attended the CAP 2018 in Japan, which had hundreds of participants and made for an excellent networking opportunity. CAP2020 was postponed to 2021, and the new SciCom Officer will participate.

PARI 2019

The Public Awareness of Research Infrastructures workshop is of particular interest to JIVE since the institute is an ERIC. The 2019 meeting took place in April, in Oxford (UK), and was attended by the SciCom Officer and a JIVE support scientist. The PARI meetings aim to share the experience of communications and outreach between different ERICs. The meeting focused on sharing best practices and provided a good opportunity for networking with other ERIC outreach staff. Several participants noted that the visibility of JIVE had been positively improved since the previous PARI meeting in 2017. JIVE was asked to participate in the RICE (Research Infrastructures Communication and Engagement) working group, related to the planning of future PARI meetings, as well as the ESOF (European Open Science Forum).



RICE working group

The RICE meeting took place in September 2019, in Brussels (Belgium), and focused on preparations for PARI 2021 and the representation of RICE members at ESO. The SciCom Officer attended. The next PARI meeting will be hosted at the SKA headquarters in Manchester, in 2021. This is an excellent opportunity for JIVE, as through the JJ WP10 we are closely involved with the SKA. Representation at ESO may be more difficult, given the limited resources available in JIVE. Continued involvement in RICE and PARI is under discussion with the new SciCom Officer.

EVN Outreach workshop

The EVN outreach network consists of a very hybrid collection of individuals, from astronomers with limited time for outreach to full-time science communication officers. To unify this network and define a coherent policy for EVN related outreach, a workshop organized by the original SciCom Officer was planned for April 2020. Unfortunately, this was right at the start of the COVID-19 pandemic, and close to the start of extended maternity leave of the SciCom Officer. In spite of the plans already relying on virtual and staggering participation, the lack of expertise and the impact of lockdown prevented us from executing this workshop.

After summer the status of the workshop was reassessed, but the responsible SciCom Officer was off duty, and within JIVE there was not sufficient expertise to proceed. This workshop is currently being discussed with the new SciCom Officer, and we expect it will take place in an adjusted format this year.

4.4. Workshops and schools

To attract new users to the EVN, workshops were organized to educate astronomers on the use of the CASA calibration software, for which VLBI specific components have been developed in JIVE. The Education of young astronomers was also exploited to highlight the scientific capabilities of the EVN.

CASA VLBI workshops

After the initial workshop in 2017, a dedicated one-day course was organized during the EVN Symposium 2018 in Granada. This was facilitated by the symposium organizers, but with a separate registration and organization through JIVE and JJ WP2. The available room could seat 60 people and was completely filled.



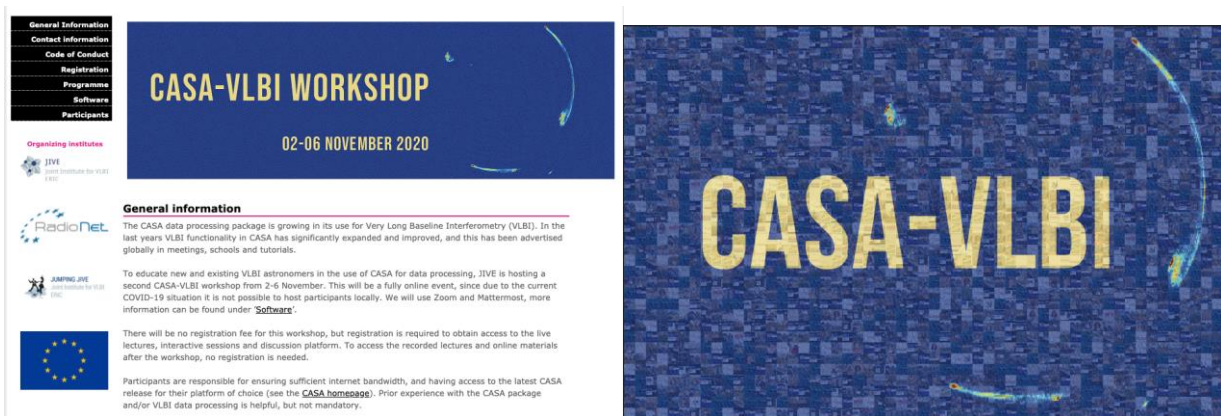


Figure 5. Website and conference image for the CASA-VLBI workshop.

An extended 4-day CASA VLBI workshop was organized in November 2020, with support from JJ and RadioNet (see Figure 5). At the start of the organization, the plan was to have 40 in-person participants and 10-15 online participants, in order to experiment with remote teaching. During the organization of the workshop the COVID-19 pandemic hit, and it was decided to move the workshop entirely online. Registration was re-opened but had to be closed prematurely at 200 registered participants, the maximum allowed number of our Zoom license.

The 4 days consisted of 2 blocks each, and each block had 2 or 3 lectures of 45 minutes and a 90 minutes hands-on session. A dedicated YouTube channel with recorded lectures allowed participants from remote time zones to participate offline before or after the live sessions. Topics discussed the basic use of CASA, specific VLBI data processing techniques and advanced calibration of VLBI observations.

This was the first fully online event organized by JIVE. It was a big success and a good learning experience for future online events, such as the 2021 EVN Mini-Symposium. As for the EAS2020, it was very notable that the free online access allowed for a significant increase in diversity, several participants hailed from countries with no or limited astronomy funding, such as Indonesia, Peru and Greece.

YERAC 2018

In September 2018 JIVE and ASTRON hosted the Young European Radio Astronomers Conference. This meeting aims to connect ~100 PhD-level radio astronomers throughout Europe, and for 50+ years it has been a key event to build up research collaborations. The event involved dedicated outreach about VLBI and saw good use of the JIVE brochure and roll-up banners. The YERAC 2018 was supported by RadioNet.



ERIS 2019

The European Radio Interferometry School is the EU analogue of the US-based NRAO Summer School. In late 2019 it was organized by Chalmers University (Gothenburg, Sweden) and JIVE was invited to provide the VLBI lectures and exercises. The school aims to teach ~100 PhD-level astronomers about radio interferometry, with a strong focus on the RadioNet supported instruments: LOFAR, ALMA and EVN. It consists of a full week of intense lectures and exercises. Due to the scale of the venue, the booth was too large, but roll-up banners, brochures and additional materials were handed out to the participants.

The participants were told about JIVE and the EVN, and the support that is available. They also practiced writing and presenting an observing proposal for an instrument of choice. About half of the teams wrote an EVN proposal, most were all of sufficient quality to have passed an actual proposal review, and in one case the proposal was actually submitted.

4.5. Other outreach activities

Every year many recurring outreach activities receive support from JJ WP2 through the involvement of the Science Communication Officer. Here is an overview.

- Event Horizon Telescope press release in April 2019: several JIVE staff are members of the EHT consortium and as such JIVE played a role in the global announcements of the first image of the shadow of a supermassive black hole. Since then, several follow-up results have appeared and where applicable, the JIVE involvement has been highlighted in a dedicated news item or press release.
- The Call for Proposals has been completely overhauled to optimize the information flow, especially for new users of the EVN, and make the design more contemporary and in line with other JIVE outreach materials.
- 25th anniversary of JIVE in December 2018: several dedicated outreach items were produced such as caps and t-shirts.
- Templates for presentations: a uniform template is available, but enforcing people to actually use it remains challenging.
- The EVN newsletter appears 3-4 times per year with the latest science results, technical updates and news on upcoming meetings.
- Press releases for EVN and related research (see Figure 6), and also for the Call for Proposals, new issues of the EVN newsletter, and job openings.
- Prepare submissions for the ASTRON/JIVE Daily Image.
- Annual reports for JIVE, bi-annual reports for the EVN.
- General public events: open day, Girls' Day, Astronomy on Tap, BlueDot.

The events for the general public have all been canceled during the COVID-19 pandemic. Though this saved some time and money, the effort required for moving all other activities to online platforms has required significant additional investment of resources.



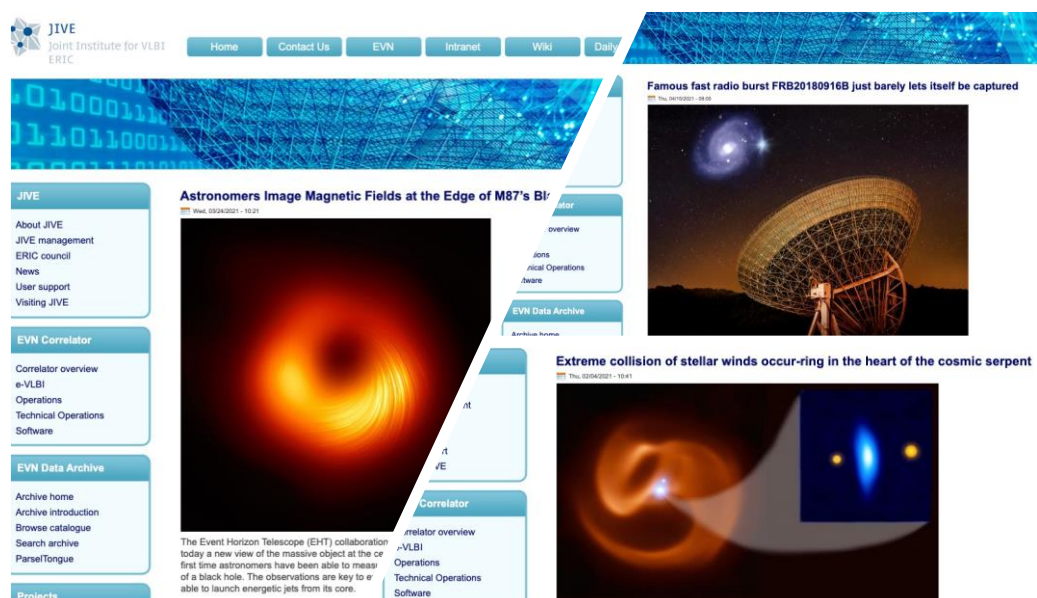


Figure 6. Examples of scientific press releases shared through the JIVE website

4.6. Online presence

Website

Though this is not formally part of the WP2 efforts, an online presence is an intricate part of any outreach activity in this day and age. The JIVE and EVN websites were both in need of a complete overhaul for security reasons as well as design. These efforts are still ongoing. The EVN website has been moved, but the back-end includes several aspects that require some handwork. For the JIVE website, the work is ongoing.

Social media

Globally there is a strong trend for younger people to obtain their news from social media outlets. For JIVE this provides an excellent opportunity to highlight the latest scientific results to early-career scientists, in order to entice them in considering the EVN for their own science. Topics shared on social media range from everyday operations at JIVE to global press releases in which JIVE staff is involved, but also highlight important changes such as the joining of Italy in the JIV-ERIC.

The original SciCom Officer set up accounts on all major social media outlets, but we found that the most effective for JIVE are Facebook and Twitter. There we share the latest news from JIVE in policy, science and technology, as well as scientific achievements made with the EVN by other astronomers and institutes. The purpose of these messages is to engage people in the daily workings of JIVE and the EVN, so there is a fair share of public interest stories. These are currently handled by separate JIVE staff, making the outreach during events somewhat complicated, but with the new SciCom officer we expect this to be a smooth process again.



5 COVID-19 impact

The impact of COVID-19 on the WP2 efforts has been mentioned in the separate sections above, the most notable one being the cancelation of the EVN Symposium in 2020. Almost all other events could go ahead as planned, in an adjusted online format. In the case of the CASA VLBI workshop, this led to an unexpected success as several participants joined who could not have attended an in-person meeting. For the EVN Outreach workshop, the events can be reviewed and rescheduled with the hiring of a new SciCom Officer, but results from this workshop are not expected to be ready before the end of the JJ project.

The pandemic also had a positive side-effect. For the major conferences, the visibility of JIVE and the EVN no longer depended on a physical presence, and the online systems allowed for efficient visibility with fewer resources. The online meetings allowed for minimizing the environmental impact, and an increase in diversity all around.

Financially, the COVID-19 has significantly lowered the travel and registration costs for meetings. Online events are frequently free, or much cheaper, with the exception of EAS 2021.

6 Impact of the WP2 work

In the past four years, the outreach and advocacy of JIVE and the EVN has been built up from scratch. We have identified our different audiences (peers, policymakers and public), and developed materials aimed mostly at peers, and to a lesser extent at the public and policymakers. The peers are mostly astronomers in the early stages of their career, where they are exploring the possibilities to broaden their research. To inform this audience about the opportunities offered by JIVE and the EVN, we organized dedicated sessions at large conferences and workshops, and JJ collaborators have been giving presentations at a wide range of venues (see Appendix Table 1). This has resulted in a solid basis for continued efforts.

The outreach and advocacy during the JJ project have reached thousands of astronomers, and hundreds of policymakers and general public members. The impact of this effort on the visibility of JIVE is difficult to measure, as the project duration is short compared to the time needed to build up a strong brand name and see the effect in the number of proposals and scientific publications. It was noted that through our original SciCom Officer, JIVE had a very visible spot at the table in many outreach-related conferences and workshops, from local to a global level. This already signifies the importance of a continuous effort and future planning of outreach and advocacy efforts (see Section 7).

The lack of an active SciCom Officer has had a serious impact, but also highlighted the clear need for a centrally coordinated outreach network for the EVN, as well as a person in JIVE who supervises and coordinates the internal processes. Several skills of the SciCom Officer are not



easily replaceable by the more technically oriented JIVE staff. To maximise the return of the JJ project, it is essential that the outreach efforts are continued and get a solid place in the daily operations of JIVE. This was clear from the smooth operations of outreach in the first years of the JJ project, where the original SciCom Officer established workflows and built up a large network in global outreach. The hiring of a new SciCom Officer is an important step to revive these efforts.

At a policy level, there have been constant efforts to expand the membership of JIVE. Earlier this year Italy joined as a full ERIC member, negotiations with Poland and Finland are ongoing. The WP2 members have been constantly involved in preparing materials for these discussions, and the growing visibility of JIVE and the EVN has a positive influence on these talks. A particularly notable effort here has been the cooperation with WP7 to distil the main points for the future of the EVN into messages for policymakers. This is still ongoing and will eventually result in a glossy brochure.

For the general public, all activities have stopped with the start of the COVID-19 lockdown in early 2020. Until that time, JIVE was mostly involved in local efforts such as the Open Day, Girl's Day and hosting local students and clubs for tours. This reached hundreds of people and helped to establish a good working relationship with the local community.

7 Future vision

At the start of the JJ project, JIVE did not have a person dedicated to outreach. During the project, it has become evident that this is a crucial role in the organization. The SciCom Officer brings a set of skills that are not or only partly available in other people. It is the combination of these skills in a single person which increases the efficiency of the work, as well as the quality, and thus it significantly improves the visibility and professional image of JIVE.

With the solid basis laid in WP2, targeted efforts can continue to interest astronomers in VLBI in general, and the EVN in specific. The JIVE staff is committed to sharing their scientific and technical expertise, and consolidating their global leadership in this field. The true impact on the user base for the EVN will require several more years to become fully visible, as the time from scientific idea to proposal and publication is usually in the same order as the JJ project duration.

The materials produced as part of the JJ project continue to be used and will see increased exposure as we move to in-person meetings again. The booth and brochures have a timeless design and content and can be used for many years to come. Online or hybrid meetings do require a different approach and the availability of materials in a digital format. This is something to explore in the near future.

Naturally, the SciCom Officer is not only involved in JJ related events, but also very active outside the project, and the impact of that has been significant. The visibility of JIVE as a



research institute has expanded to groups focusing on diversity, sustainability and global climate impact. These audiences were not part of the original plans, but have proven to be extremely valuable for the global visibility of JIVE. Especially at the policymaking level, these topics are high on the agenda, and attaching the JIVE brand is an enormous potential benefit. The participation of JIVE in the H2020 Opticon-Radionet Pilot allows for a natural continuation of this.

Immediate future

With the instalment of a new SciCom Officer, the JIVE and EVN outreach can continue at the pace that was set during the JJ project, including the exploitation and dissemination of the JUMPING JIVE results in the following years. Re-starting the framework in JIVE, such as the JIVE Outreach Team, is essential. This is already happening, and we expect this to be completed in the next months. Another key aspect of the work involves reviving the EVN outreach network built as part of this project and consolidate its operations.

The day-to-day work of the SciCom Officer will focus on a wealth of aspects, such as news items, press releases, daily image submissions, providing content for the JIVE and EVN websites and ensuring they remain up to date. Another important role is in providing support for the necessary reporting for JIVE and the EVN.

All efforts related to outreach and advocacy need to come together in a coherent strategy. This is still in draft form and will be further developed in the coming year. This will help to expand our efforts towards audiences that have remained in the background during JJ, such as policymakers. The H2020 Opticon-RadioNet Pilot (ORP) project plays an essential role in supporting this work for the coming years and enables JIVE to also reach out to optical astronomers in a more direct way.

Longer-term future

For the next 5-10 years, JUMPING JIVE made clear that consolidating outreach and advocacy as an essential element of JIVE is a key goal. The current SciCom Officer is a temporary hire (2+1 years), but for establishing and maintaining the efforts, this needs to become a permanent position.

JIVE has been a well-established research entity for almost 3 decades, and developing our position in global radio astronomy for the decades to come requires continued efforts, from training new VLBI astronomers to lobbying with global political leaders. All these efforts require a solid basis in outreach and advocacy, materials such as hand-outs, brochures for different audiences, and a clear online presence. The JJ project has provided a firm base for this, on which we can continue to grow and develop.



Appendix

Table 1. Outreach and advocacy activities under the JUMPING JIVE project

| Title | Presenter/organiser | Date | Meeting | Location |
|---|---|---------------------|-------------------------------|---------------------------|
| EVN Mini-symposium and Users' Meeting | Denise Gabuzda, Ilse van Bemmél, Paco Colomer | 12-14 Jul 2021 | EVN symposium | Online |
| EAS 2021 Special Session 11 | Ilse van Bemmél | 28 Jun – 2 Jul 2021 | EAS 2021 | Online |
| DARA Unit 4 training lectures | Rob Beswick et al. | 3-14 May 2021 | DARA school | Online |
| EVN Science Vision and Roadmap | Tiziana Venturi | 2-5 Mar 2021 | 13th East Asian VLBI Workshop | Online |
| Prospects for EVN and uGMRT observations | Tiziana Venturi | 11 Feb 2021 | VLBI with uGMRT | Online |
| CASA VLBI workshop | Ilse van Bemmél, others | 2-5 Nov 2020 | Workshop | Online |
| VLBI20-30: A scientific roadmap for the next decade | Francisco Colomer | 15 Jul 2020 | SEA 2020 | Online |
| EAS Special Session 16 | Ilse van Bemmél, Tiziana Venturi | 28 June 2020 | EAS2020 SS 16 | Online |
| Mandarijntjes op de maan | Ilse van Bemmél | 14 Feb 2020 | Public lecture | Volkssterrenwacht Bussloo |
| SKA-VLBI capabilities and techniques | Cristina Garcia Miro | 25-28 Nov 2019 | SKA meeting | Shanghai |

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|---|----------------------|----------------|---------------------------|-----------------------|
| Software Projects at JIVE | Mark Kettenis et al | 18-20 Nov 2019 | 8th IVTW | Sydney, Australia |
| Outreach for the EVN | Gina Maffey | 13 Nov 2019 | EVN CBD presentation | Dwingeloo |
| Updating the EVN vision document | Tiziana Venturi | 13 Nov 2019 | EVN CBD presentation | Dwingeloo |
| SFXC update | Mark Kettenis | 11-15 Nov 2019 | 13th DiFX Users Meeting | Swinburne, Australia |
| High resolution radio astronomy: an outlook for Africa | Leonid Gurvits et al | 7-11 Oct 2019 | IAU Symposium 356 | Addis Ababa, Ethiopia |
| SKA-VLBI science cases | Cristina Garcia Miro | 14-17 Oct 2019 | SKA-VLBI workshop | Manchester, UK |
| SKA-VLBI capabilities | Cristina Garcia Miro | 14-17 Oct 2019 | SKA-VLBI workshop | Manchester, UK |
| JUMPING JIVE in support of SKA and VLBI | Paco Colomer | 14-17 Oct 2019 | SKA-VLBI workshop | Manchester, UK |
| Radio astronomy an exploration of space in our daily life | Leonid Gurvits | 9 Oct 2019 | Addis Ababa high school 4 | Addis Ababa, Ethiopia |
| VLBI lecture and tutorials | Ilse van Bemmelen | 7-11 Oct 2019 | ERIS2019 | Gothenburg |
| The European VLBI Network (EVN/JIVE) | Paco Colomer | 3-5 Oct 2019 | RT-32 workshop | Zolochiv, Ukraine |
| Update on EVN and JIVE and the Global VLBI Alliance | Paco Colomer et al | 24-28 Sep 2019 | 12th EAVN | Mito, Japan |



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|---|-------------------|------------------|--|--|
| Development plans for JIV-ERIC | Paco Colomer | 21- 23 Aug 2019 | BAASP2019 | Ventspils, Latvia |
| Space Science frontier of radio interferometry: Irbene | Leonid Gurvits | 21 - 23 Aug 2019 | BAASP2019 | Ventspils, Latvia |
| DARA Unit 4 training lectures | Rob Beswick et al | 1-12 Jul 2019 | DARA school | Kenya, Ghana, Botswana, Madagascar |
| A scientific roadmap for VLBI in the next decade (poster) | Tiziana Venturi | 25-27 Jun 2019 | Astrophysical Frontiers in the Next Decade | Charlottesville, USA |
| It's complicated - how can we communicate radio astronomy in a visual world? | Gina Maffey | 24-28 Jun 2019 | EWASS | Lyon |
| DARA Unit 4 training lectures | Rob Beswick et al | 17-28 Jun 2019 | DARA school | Mozambique |
| JUMPING JIVE | Rob Beswick | 2-7 Jun 2019 | DARA annual network meeting | South Africa |
| Astrometric VLBI and celestial reference frames | Patrick Charlot | 30 May 2019 | Colloquium | Hartebeesthoek |
| Updating the EVN vision document | Tiziana Venturi | 16 May 2019 | EVN CBD presentation | Bologna |
| DARA Unit 2/3 training lectures | Several | 13-31 May 2019 | DARA school | Hartebeesthoek |
| The real-time European VLBI Network, a pathfinder for SKA | Paco Colomer | 12-15 May 2019 | SKA pathfinder workshop | Aveiro, Portugal |
| DARA Unit 2/3 training lectures | Several | 6-24 May 2019 | DARA school | Ghana |



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|--|---------------------------|---------------------|------------------------|---------------|
| System Monitoring using e-RemoteCtrl and Zabbix in the JumpingJIVE Context | Alexander Neidhardt | 5-9 May 2019 | TOW | Haystack, USA |
| Programming Station Code in C++ and Automating Processes for the NASA Field System | Alexander Neidhardt | 5-9 May 2019 | TOW | Haystack, USA |
| VLBI in the space science context at JIVE | Leonid Gurvits | 23 Apr 2019 | Colloquium Arecibo | Puerto Rico |
| Autonomous observations of VLBI radio telescopes | Alexander Neidhardt et al | 17-19 Mar 2019 | IVS EVGA | Gran Canaria |
| Centralized monitoring of VLBI antennas for seamless auxiliary data (poster) | Alexander Neidhardt et al | 17-19 Mar 2019 | IVS EVGA | Gran Canaria |
| Remote access to the NASA Field System via Web browser (poster) | Alexander Neidhardt | 17-19 Mar 2019 | IVS EVGA | Gran Canaria |
| Implementation of a geodetic path at the JIVE correlator | M.E. Gomez et al | 17-19 Mar 2019 | IVS EVGA | Gran Canaria |
| Recent technical developments at JIVE | Aard Keimpema et al | 17-19 Mar 2019 | IVS EVGA | Gran Canaria |
| VLBI techniques | Paco Colomer | 25 Feb - 1 Mar 2019 | Regional VLBI workshop | Mexico |
| VLBI networks | Paco Colomer | 25 Feb - 1 Mar 2019 | Regional VLBI workshop | Mexico |
| Transient science with e-VLBI | Zsolt Paragi | 25 Feb - 1 Mar 2019 | Regional VLBI workshop | Mexico |



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|--|----------------------|-----------------|--------------------------------------|-----------------|
| AVN and JIV-ERIC | Paco Colomer | 2019 | Africa-Europe collaboration workshop | Brussels |
| What can VLBI do for your research? The EVN and JIVE | Paco Colomer | 2019 | Colloquium NARIT | Thailand |
| Updating the EVN vision document | Tiziana Venturi | 28 Nov 2018 | EVN CBD presentation | Dwingeloo |
| A vision of the future of the EVN | Michael Lindqvist | 12-15 Nov2018 | VLBI Technology workshop | Thailand |
| High sensitivity VLBI with SKA | Cristina Garcia Miro | 8-11 Oct 2018 | EVN Symposium | Granada |
| JUMPING JIVE (poster) | Giuseppe Cimo | 8-11 Oct 2018 | EVN Symposium | Granada |
| CASA-VLBI workshop (1 day) | Ilse van Bemmell | 11 Oct 2018 | EVN Symposium | Granada |
| What can VLBI do for your research | Paco Colomer | 4-7 Sep 2018 | EAVN workshop | Korea |
| Geodetic VLBI support in SFXC | Mark Kettenis | 3-7 Sep 2018 | 12th DiFX Users Meeting | Wetzell (D) |
| General outreach activities | Gina Maffey | 20 Jul 2018 | Bluedot festival | Manchester (UK) |
| What can VLBI do for your research? The EVN and JIVE | Paco Colomer | 16-20 July 2018 | Spanish Astro-nomical Society | Salamanca |
| Workshop | Gina Maffey | 16 Jun 2018 | Bessensap | Amsterdam |



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|--|-----------------------|----------------|---------------------------------|--|
| Geodetic capabilities at the JIVE SFXC correlator | Paco Colomer | 3-9 Jun 2018 | IVS GM | Longyearbyen (N) |
| DARA Unit 4 training lectures | Rob Beswick et al | Jun 2018 | DARA school | Kenya, Ghana, Madagascar, Botswana, Zambia |
| The VLBI future: roadmap to next decade | Tiziana Venturi | 15 May 2018 | EVN CBD presentation | Shanghai |
| JUMPING JIVE | Rob Beswick | 2-4 May 2018 | DARA Annual network meeting | South Africa |
| DARA Unit 2/3 training lectures | Patrick Charlot et al | 9-27 Apr 2018 | DARA school | Hartebeesthoek |
| JIVE RadioNet SPOOR | Paco Colomer | 9 May 2018 | | Amsterdam |
| A science case for a VLBI station in Abu Dhabi | Leonid Gurvits | 24-26 Mar 2018 | UAE deep space antenna | Abu Dhabi |
| Radio astronomy and exploration of space in our daily life | Leonid Gurvits | 24 Mar 2018 | Public lecture | Abu Dhabi |
| How do you provide the sharpest view on the Universe? | Gina Maffey | 23-31 Mar 2018 | CAP2018 | Japan |
| Radio astronomy frontier of space science and exploration | Leonid Gurvits | 7 Mar 2018 | National Polytechnic University | Yerevan (Armenia) |
| Radio astronomy and our daily life | Leonid Gurvits | 6 Mar 2018 | Public lecture | Yerevan |



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|---|------------------------------------|----------------|--------------------------------|------------|
| VLBI, an example of international collaboration in science | Leonid Gurvits | 15 Dec 2017 | Accademia Nazionale Dei Lincei | Rome |
| News from JIVE on space science VLBI and prospects for future collaboration | Leonid Gurvits | 27 Nov 2017 | Colloquium | Torun (PL) |
| The VLBI future: roadmap to next decade | Tiziana Venturi | 14 Nov 2017 | EVN CBD presentation | Onsala |
| EC H2020 JUMPING JIVE project | Paco Colomer | 20-21 Oct 2017 | Astronomy Town Hall meeting | Cape Town |
| Masers: what can VLBI do for you? | Paco Colomer & Huib van Langevelde | 4-8 Sep 2017 | IAU Symposium 336 | Cagliari |
| JIVE: an example of a new European Research Entity | Paco Colomer | 27-30 Jun 2017 | EWASS | Prague |
| Global VLBI in the SKA era | Arpad Szomoru | 2017 | IEEE | |



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Table 2. Publications related to JJ

High resolution radio astronomy: an outlook for Africa; Leonid Gurvitz, Rob Beswick et al.

January 2020; <https://arxiv.org/abs/2001.04576>

Setting the world's eye on the sky with the SKA; Cristina García-Miró, Zsolt Paragi, Antonio Chrysostomou, Gina Maffey

December 2019 [SKA Contact article](#)

Recent VLBI results on SN1986J <...>; Michael Bietenholz et al; 2019; <https://arxiv.org/abs/1905.06690>

High Sensitivity VLBI with SKA; Cristina García-Miró, Antonio Chrysostomou, Zsolt Paragi, Ilse van Bemmelen

20 March 2019; <https://arxiv.org/abs/1903.08627v1>

SKA-VLBI Key Science Programmes; Zsolt Paragi, Antonio Chrysostomou, Cristina Garcia-Miró

29 January 2019; <https://arxiv.org/abs/1901.10361v1>

JUMPING JIVE; Giuseppe Cimo

January 2019; EVN Newsletter article

The Smart Observatory for autonomous and remote observations; Alexander Neidhardt et al.

2018; [IVS GM](#)

A new generation of Wettzells remote access to the NASA Field System using web-based techniques; Alexander Neidhardt

2018; [IVS GM](#)

A student shaping the future of African astronomy; Gina Maffey

2018; [Naturejobs Blogs](#)

Manchester astronomers help deliver advanced STEM skills training in Africa; Rob Beswick & Anna Scaife

Manchester University blog: <https://www.manchester.ac.uk/research/impact/sdgs/equality/stem-africa-sdg-9/>

SKA South Africa sees first light with addition of Ghana baseline antenna; Staff writers

2017; Space Daily blog:

https://www.spacedaily.com/reports/SKA_South_Africa_sees_first_light_with_addition_of_Ghana_baseline_antenna_999.html



Table 3. Additional outreach and advocacy activities coordinated and supported by the JIVE SciCom Officer

This table does not include press releases, which can be found on the JIVE news website (<http://jive.eu/articles/news>).

| Activity | Lead people | Date | Project | Category |
|---|--|------------------|---------|----------|
| EVN website | Gina Maffey, Aukelien van den Poll, Katharina Immer | Running activity | EVN | Resource |
| JIVE website | Gina Maffey, Aukelien van den Poll | Running activity | JIVE | Resource |
| Social media | Katharina Immer, Gina Maffey, Zsolt Paragi, Paco Colomer | Running activity | JIVE | Resource |
| EVN call for proposals | Gina Maffey | 3x per year | EVN | Article |
| EVN Newsletter | Gina Maffey, Paco Colomer, Katharina Immer | 3-4x per year | EVN | |
| JIVE Annual report | Gina Maffey, Paco Colomer | 1x per year | JIVE | |
| SKA signal and data consortium concludes design work | Paul Boven | 2019-01-25 | SKA | Article |
| EVN biennial report | Gina Maffey, Paco Colomer | 2019-02-20 | EVN | Article |
| A global network of radio telescopes exposes the aftermath of a violent merger of neutron stars | Katharina Immer, Zsolt Paragi | 2019-02-21 | EVN | Article |
| Astronomers capture first image of a black hole | Gina Maffey | 2019-04-10 | EHT | Article |



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|--|--|------------|------|----------|
| EHT announcement | Gina Maffey, Ilse van Bommel, Huib Jan van Langevelde, Mark Kettenis, Benito Marcote, Paco Colomer | 2019-04-10 | EHT | Event |
| Radio interview: RTV Drenthe | Ilse van Bommel | 2019-04-10 | EHT | Event |
| Schools talk | Ilse van Bommel | 2019-06-01 | EHT | Event |
| Radio interview: Hoogeveen | Huib Jan van Langevelde | 2019-01-25 | EHT | Event |
| Astronomy on Tap - Leiden | Huib Jan van Langevelde | 2019-04-29 | EHT | Event |
| Horizon van de Verbeelding' | Huib Jan van Langevelde | 2019-05-21 | EHT | Resource |
| Telescopes in space for even sharper images of black holes | Leonid Gurvits | 2019-05-07 | JIVE | Article |
| Ruimtevaart no.3 2019 | Gina Maffey, Leonid Gurvits | 2019-05-22 | JIVE | Article |
| Visit - Italian ambassador | Gina Maffey, Bob Campbell | 2019-05-31 | JIVE | Event |
| Annual report | Gina Maffey | 2019-06-01 | JIVE | Resource |
| Astronomers observe the 'smoking gun' of an orphan gamma-ray burst afterglow | Gina Maffey, Benito Marcote | 2019-06-17 | EVN | Article |
| ESCAPE website | Gina Maffey | 2019-07-11 | JIVE | Resource |
| Training the next generation of support scientists | Gina Maffey | 2019-07-19 | JIVE | Article |
| Summer student presentation | Gina Maffey | 2019-07-09 | JIVE | Event |



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|------------------------------------|---|------------|------|----------|
| ADASS, Groningen | Harro Verkouter, Arpad Szomoru, Yvonne Kool | 2019-10-06 | JIVE | Event |
| Visit - Chessmasters | Gina Maffey, Martin Leeuwinga, Bert Harms | 2019-10-23 | JIVE | Event |
| ASTROFEST | Gina Maffey | 2019-11-06 | JIVE | Event |
| EVN CBD | Gina Maffey | 2019-11-13 | EVN | Event |
| CASA news | Ilse van Bemmelen | 2019-11-22 | JIVE | Article |
| SKA calendar | Gina Maffey, Giuseppe Cimo | 2019-11-22 | SKA | Resource |
| Visit - Natuurmonumenten | Gina Maffey | 2019-12-05 | JIVE | Event |
| Imaging a water maser superburst | Katharina Immer, Benito Marcote | 2019-12-13 | EVN | Article |
| JIVE Christmas card | Gina Maffey | 2019-12-13 | JIVE | Resource |
| Press release - FRB | Benito Marcote, Gina Maffey | 2020-01-06 | EVN | Article |
| Press release - special issue | Leonid Gurvits, Gina Maffey | 2020-01-15 | JIVE | Article |
| Press release - EVN distant blazar | Gina Maffey | 2020-01-09 | EVN | Article |
| Press release - cosmic cow | Zsolt Paragi, Gina Maffey | 2020-01-28 | EVN | Article |
| Press release - Jason Hessels | Gina Maffey | 2020-02-19 | JIVE | Article |
| Press release - EHT | Gina Maffey | 2020-04-07 | EHT | Article |



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