

“Hello, World!” Harnessing Social Media for the Rosetta Mission

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The European Space Agency’s comet-chasing *Rosetta* mission was launched in 2004, before social media became a popular tool for mainstream communication. As it reached its destination ten years later, new audiences were reached and inspired by this once-in-a-lifetime event by harnessing a range of outlets for communicating the key messages. These included traditional online platforms, such as news websites, blogs, and Livestream, as well as Twitter, Facebook, Instagram, Flickr, YouTube, Google+ and SoundCloud. In this article, we outline the role social media channels played in making *Rosetta* one of the European Space Agency’s biggest communication and public engagement successes.

Introduction

*Rosetta*¹ is the first European Space Agency (ESA) mission for which social media were employed as an intrinsic aspect of the communication strategy. Several *Rosetta*-specific social media accounts — @ESA_Rosetta on Twitter, the Rosetta Mission Facebook page, and the rosettamission Instagram account — were developed during 2013 and 2014, and were used alongside the traditional reporting line of the main ESA website, the Rosetta blog, and live press events, to build awareness of the mission. By coordinating these mission-specific accounts with ESA’s existing social media channels (which include Flickr, YouTube, Google+, Twitter, and Facebook), Deutsches Zentrum für Luft- und Raumfahrt’s (DLR) English-language @Philae2014 Twitter account, and through the support of ESA’s country desks and *Rosetta*’s partner agency accounts information could be shared in a number of European languages, ensuring

a wide reach across Europe and the world². Each channel played a well-defined role in terms of the audience it reached and the content it delivered.

Rosetta blog

The Rosetta blog³ acts as a bridge between classic social media and the traditional reporting line of the corporate ESA Portal⁴ and in-depth Science and Technology⁵ websites — the home of ESA’s press releases and news stories. The blog was initially set up in 2008 ahead of *Rosetta*’s flyby of asteroid Šteins and followed the mission up until hibernation in June 2011, before being re-launched in late 2013, during the preparations for the Wake Up, Rosetta! activities.

In the months following *Rosetta*’s wake-up in January 2014, the spacecraft was prepared for studying Comet 67P/Churyumov–Gerasimenko (Comet 67P/C-G) and the

mission operations teams and instrument teams contributed to blog posts in order to introduce the spacecraft’s science payload. With eleven experiments on the orbiter and ten on the lander, this process enabled us to lay the groundwork for the science that would be carried out later in the mission and to explain why it was important, while also allowing us to build working relationships with the various mission teams. The blog was also an important channel for explaining what the mission operations experts were doing, as *Rosetta* carried out a number of “operations-intensive” activities leading up to arrival at the comet.

A range of other topics were also presented on the blog to provide context to the mission and to appeal to different audiences: these included a brief history of comet observations, the story of Comet 67P/C-G’s discovery, Earth-based observations of the comet, and the evolution of artist’s impressions of the comet.



Figure 1. Example of the “Hello, World!” tweet being acknowledged in traditional media.

On the final approach to Comet 67P/C-G between May and August 2014, the blog was used to report the ten braking manoeuvres needed for the spacecraft to be placed in the same orbit as the comet and rendezvous with it. As the comet images became clearer and more defined, the blog acted as the main repository for image releases, including the regular CometWatch series, which features images from *Rosetta*'s navigation camera and still continues today.

The blog was also used for live reporting during the key events of wake-up, arrival, and landing, alongside audio-visual live-streaming.

During the week of the comet landing in November 2014, the blog was one of the primary public information channels and operated almost 24 hours a day over a five-day period. After the landing of *Philae* on 12 November, the blog continued to cover its activities right up until the primary battery was exhausted overnight on 14–15 November. This last important event was not livestreamed and the blog was one of the only channels available to officially follow the final hours *Philae*'s operations on the surface of the comet, alongside the Twitter accounts of @ESA_Rosetta, @Philae2014, @esaoperations, and three external social media reporters who worked alongside the ESA team that evening⁶. The 1.39 million views of the Rosetta blog on 12 November, and a total of 5.5 million views throughout the month of November, are the highest counts ever achieved on an ESA blog for any topic to date.

As of December 2015, over 530 posts have been published (since late 2013) and the blog receives between about 3000 and 20 000 visits daily, with each post generating anything from tens to hundreds of

comments. By enabling a comment function, the blog allows the editors to have a dialogue with readers, as well as allowing readers to have conversations amongst themselves. That said, it must be noted that many individual discussions are dominated by a recurring group of 10 to 20 extremely active commenters. Often questions that arise in the comment section are the trigger for new blog posts to satisfy frequently asked questions. Blog users have left many positive comments regarding the level of technical details communicated on this platform.

As a testament to the authority of the blog as a source of information about the mission, many online and print-media journalists writing stories reference the blog for additional technical details that may not be included in ESA's more general web articles or press releases, or to illustrate their articles with the most recent CometWatch image. Furthermore, the mission scientists and operators have cited the blog as the first place they look for updates on aspects of the mission that are outside their own areas of expertise, and several have engaged directly through the comment section, answering questions and providing additional details for the readers.

@ESA_Rosetta on Twitter

The use of the Twitter handle @ESA_Rosetta is the first time that ESA has created a first-person Twitter account for a spacecraft, following as realistically as possible the actions of the real *Rosetta* spacecraft, and translating technical information into updates of 140 characters or less. The key moment for the account was the wake-up of the spacecraft on 20 January 2014 following more than two and a half years of

hibernation. In all the press material leading to the wake-up, the account was promoted as being the first official way to find out whether the spacecraft was awake; until this moment the account was deliberately dormant, mimicking the sleeping spacecraft.

During the lead-up to 20 January, the day that *Rosetta* was programmed to wake up, a social media campaign was run asking people to shout — virtually — at the @ESA_Rosetta Twitter account, using the hashtag #WakeUpRosetta. This chance to participate clearly appealed to Twitter audiences as it trended for several minutes in Europe on the day, with peaks in the number of tweets at 11:00 (CET) — the programmed wake-up time on the spacecraft's on-board clock — and eight hours later between 18:30 and 19:30 (CET) — the window during which the signal was expected.

When *Rosetta* woke up, a simple but familiar message of “Hello, World!” was tweeted, not just in English, but in the 23 languages of ESA's member and cooperating states. This allowed followers to engage by re-tweeting in their own native language, raising awareness across Europe. The use of multilingual tweets was also a strategy repeated for the arrival in August, where “Hello, Comet!” was tweeted in different languages, along with a “post-card” — the arrival image of the comet.

On the day that *Rosetta* woke up, the @ESA_Rosetta account grew very significantly by around 37 000 followers, with nearly 45 000 following the account by the end of January 2014. The use of the Twitter account to announce the wake-up was reported widely in online news and crossed over into traditional news and TV media channels, which set the stage for the channel for the year ahead (see Figure 1).

During the year, the personalities of @ESA_Rosetta and @Philae2014 (a first-person account for the lander managed by DLR, the lead agency for *Philae*) developed as they followed events in real time and as their adventures were recounted through the cartoon series. The tone of the conversations was of two friends on a great adventure. The accounts tweeted each other regularly, especially in the lead-up to and during the events of comet landing.

While the Twitter accounts play an important role in sharing content from other



Figure 2. A sample of the messages of congratulations for the comet landing sent from high-profile Twitter account holders.

platforms, making general status updates and sharing new images and science results, the first-person approach crucially makes it possible for the spacecraft to describe how they are feeling. Often a tweet will be accompanied by an image from the cartoon series to express how they might be feeling during tense or exciting moments. By sharing human traits and emotions, a direct connection is made with human followers (Mignone et al., 2016; Vertesi, 2010; Gomez, 2014). By contrast, other ESA Twitter accounts — notably, @esaoperations and @esasience — continued tweeting throughout the mission with non-personified content and factual updates or scientific context, to ensure that they were strongly differentiated from the human voices of the spacecraft and lander Twitter accounts. It is interesting to note that the non-personified accounts

also increased their follower count at the key *Rosetta* milestones, indicating that a complete level of engagement via Twitter benefits from both styles.

In addition to the 24-hour reporting line of the blog during the activities surrounding the comet landing during the week of 10–15 November 2014, information was also shared in real time via the @ESA_Rosetta and @Philae2014 accounts. They were closely coordinated to maintain the conversational dialogue, with a number of tweets around key moments agreed in advance. During comet landing day @ESA_Rosetta and @Philae2014 gained 156 000 and 287 000 new followers respectively.

On landing day itself, farewell images taken by the two spacecraft of each other shortly after separation were returned to Earth and presented in a press briefing. In parallel, the images were exchanged online through tweets by the two spacecraft, a highlight of the seven hours between separation and landing. Messages of support during the descent and congratulations following touchdown were received from around the world and from high-profile Twitter accounts including those of actors, politicians, heads of state, astronauts, international brands and TV personalities (see Figure 2).

Twitter had officially partnered with ESA to give priority within their network on landing day, acknowledging the historic importance of the *Rosetta* mission. Twitter provided several services including access to special promotion channels, target group promotions, video channels, and a curator service, all of which contributed to the wide reach. This included the presence of Twitter staff at ESA’s mission control centre at the European Space Operations Centre (ESOC) where the main activities were occurring. The hashtag #cometlanding was used throughout, with peak volumes of tweets recorded around the times of separation and landing. At touchdown the hashtag was the number one worldwide trending topic.

Soon after landing it became apparent that the lander was not secure and had bounced. It arrived at its final location on the comet two hours after the first touchdown. The first images from this location were again shared by @Philae2014 and

@ESA_Rosetta in parallel with a press briefing on 13 November and operational updates provided as the events unfolded. The illumination conditions at the location meant that *Philae* would not be able to charge its solar-powered secondary batteries and was destined to enter hibernation after completing its first set of primary battery-powered science experiments.

The unexpected nature of the landing meant that no formal live broadcasts had been scheduled for this hibernation event, and so the final Twitter conversation between @ESA_Rosetta and @Philae2014 was created almost in real time as we received new information regarding the operational status of *Philae* — this was in stark contrast with conversations around other key moments, which had been drafted well in advance. This spontaneous, unscripted coverage was only possible thanks to mission operators allowing members of the ESA communication team to work with them at the European Space Operations Centre (ESOC), including the human handler of @ESA_Rosetta, and with DLR’s team at the Lander Control Center in Cologne, where the account holder of @Philae2014 was based. The twitter account operators were in continuous Skype contact to discuss how to evolve and conclude the conversation.

The exchanges between the two accounts during *Philae*’s final hours and minutes of operations in particular touched the hearts of our followers. Apart from status updates reported on the blog and shared to the Facebook page, Twitter was the only other way to follow the events that unfolded on that night as they happened. It also provided the ideal platform for followers to express and share their emotions, likely contributing to the high level of engagement.

In the same way that @ESA_Rosetta had remained dormant while the spacecraft was in hibernation @Philae2014 did not tweet again until mission operators received a signal from the lander in June 2015. Although reliable communication between the two spacecraft was not restored at this time — prohibiting the Twitter spacecraft from continuing their conversations — the @ESA_Rosetta account (along with the Facebook page) continues to be asked for status updates on *Philae*, a testament to the popularity of the two characters.

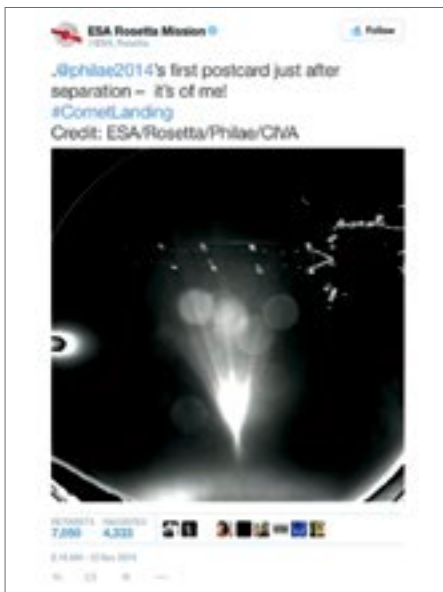


Figure 3. Shortly after they were downloaded from the spacecraft on 12 November 2014 farewell images of the parting spacecraft were shared on Twitter in parallel with live press briefings.

Rosetta Mission Facebook

The Rosetta Mission Facebook page⁷ was launched on 10 December 2013, on the occasion of the first official media briefing ahead of the wake-up of *Rosetta* and to provide the central point for the Wake Up, Rosetta! video competition (O’Flaherty et al., 2016). The competition was implemented using the Woobox tool embedded in the Facebook environment, making it possible for the public to submit entries easily; the same approach was also used for the Rosetta, are we there yet? photo contest which ran from July to August 2014⁸.

More generally, the Facebook page is not a primary channel and is not news driven, but is used by the communication team to share content from other platforms, in particular new images, videos, and blog posts, as well as links to local *Rosetta* events. Followers of the Facebook page spontaneously share their *Rosetta*-related photos and experiences on the page, for example, photos of themselves or family members wearing *Rosetta* T-shirts or showing what they have done with their paper models of the spacecraft provided for the Rosetta, are we there yet? contest in July 2014. The most popular activity was the unprompted use of the models to decorate Christmas trees in December 2014.

Facebook, along with Twitter, is also a popular choice for people sharing their photos of comet-shaped potatoes and other foodstuffs and their *Rosetta*-inspired artwork or baking, showing just how widely the mission has infiltrated everyday life and become a household name.

Rosettamission Instagram

The rosettamission Instagram account⁹ was set up in late 2013, but was not actively used until the launch of the Rosetta, are we there yet? contest in July and August 2014 when it was used as an additional entry point to the competition. The platform is now used to share the latest images of the comet and has over 23 000 subscribers, attracting a different demographic to the more formal news-driven platforms.

Using ESA’s existing social media channels

The *Rosetta* mission social media channels are supported by ESA’s own social media channels across Flickr, YouTube, Google+, Twitter, Facebook, Livestream and SoundCloud¹⁰. To capitalise on the reach of existing ESA channels such as YouTube and Flickr, playlists and photo-sets were created, rather than starting new accounts from scratch.

Google+

ESA’s Google+ channel has been used to share content and to host Google+ Hangouts since late 2013. A total of five *Rosetta*-specific hangouts were hosted in 2014 and 2015 to present specific aspects of the mission, allowing members of the public to meet the faces behind the mission and to have a dialogue with them through live question and answer sessions.

Hangouts also offer an informal alternative to a traditional press briefing, attracting a more general audience. For example, during the last day of the comet landing activities, and due to the unexpected nature of events, a hangout was conducted live from ESOC in place of a traditional live-streamed press briefing. This had not been foreseen, with the entire hangout planned on the day in the few hours before being broadcast. It was watched live by 13 000

viewers and has since attracted over 380 000 views (by comparison, the hangouts held earlier in the year attracted several hundred live viewers). Google+ also shared the hangout on their page. As of December 2015 the full set of hangouts has collectively attracted nearly half a million replays on ESA’s YouTube channel.

YouTube

ESA’s YouTube channel is used to share video replays of events, scientific and technical animations, and other unique video content, such as the short science fiction film, *Ambition* (McCaughrean, 2016), the *Rosetta & Philae* cartoon series (Mignone et al., 2016), and new musical pieces by Vangelis composed especially for the comet landing¹¹. These are organised into a number of *Rosetta*-related playlists for ease of access.

The overall ESA YouTube account attracted 3.5 million views during comet landing week, a dramatic increase from the 167 000 views on 6 August, the date of the comet rendezvous. As of October 2015, 8.7 million views have been made on *Rosetta*-related videos, 27% of the total number on the channel.

Flickr

ESA’s Flickr account attracted 16.8 million views on landing day, accounting for 15% of all views since the platform was established in 2004. The all-time top-ten viewed images on the channel remain the top ten navigation camera (NavCam) images released on 11 November. Flickr also featured *Rosetta* images in its well-known weekly blog. For comparison, ESA’s Flickr channel gained 2.9 million views on 6 August, when the first high-resolution images of Comet 67P/C-G were released, while average daily views at other times are around 50 000.

SoundCloud

The esaoperations SoundCloud account was used to share a handful of authentic sounds from *Rosetta*, including correct pronunciation of the name of the comet and landing site¹². In particular, an audio track, *The Singing Comet*¹³, a sonification

of magnetic field data created by the *Rosetta* RPC–MAG instrument team, was posted on this account on 11 November, the day before landing. Perhaps because it added a new layer to the immersive experience of being at the comet with *Rosetta*, this piece became a worldwide sensation, widely shared on various social media channels and used by many news outlets worldwide in their reports, with almost six million listens on SoundCloud.

Livestream

Livestream was used to deliver live coverage at wake-up, arrival, and during comet landing week, and to reach a wide general audience. For example, 10 million people watched the live webcasts from ESOC during the period 11–13 November 2014, with 74% of the views occurring on landing day. According to Livestream it was the single biggest event in the history of the company. In comparison, 500 000 people had watched each of the live webcasts during the one-day events on the occasion of the 20 January 2014 wake-up and 6 August 2014 arrival at the comet.

Other ESA Twitter and Facebook accounts

The ESA Facebook account, the Twitter accounts @ESA, @esaoperations and @esascience, the Twitter accounts of ESA’s major country desks and various accounts of ESA’s astronauts and of the *Rosetta* mission partners, all played a key role in helping to provide and share *Rosetta*-related content to different audiences and in different languages. They all experienced a boost in followers around the key mission milestones, and especially during comet landing.

Reflection

The use of a variety of social media platforms to target different audiences with specific content in a coordinated way has made it possible for us to bring a personal touch to the mission and to share its more human aspects alongside the more scientific and technical information, allowing our audiences to be a part of every step of the adventure. This approach not only raised awareness of *Rosetta*, but also led many

people to discover ESA and its much wider array of missions and activities for the first time.

A cross-media approach ensured that the social media activities were featured in more traditional media output from ESA, including our TV channels and traditional press releases. Similarly, conventional outside media including TV and newspapers frequently referred to and used aspects of the social media materials in their coverage.

In particular, the first-person Twitter accounts of *Rosetta* and *Philae*, in combination with the anthropomorphic cartoons, were used as part of a carefully orchestrated social media plan throughout the year. This attracted significant attention from traditional media, where it was lauded as an effective way of allowing people to engage with the mission, further enhancing its visibility. In particular, the conversations between @ESA_Rosetta and @Philae2014 were featured in many online and traditional media reports of the comet landing events.

Another measure of the extraordinary impact of the *Rosetta* mission can be seen in the fact that it featured in the 2014 highlight summaries of many social media channels: it was in Google’s *A Year in Search*, Twitter’s *Moments*, and Facebook’s *Year in Review*. Google also celebrated the successful touchdown in the form of a Google Doodle released on landing day, created in a formal partnership with ESA. Google also featured the comet landing in their New Year’s Eve 2014 Google Doodle, this time without prior contact with ESA. This recognition by some of the biggest online and social media channels is testament to

the wide reach of the mission, publicised by our activities on social media.

A key part of the success of the overall communication achieved around *Rosetta* can be attributed to the degree of trust that has developed between the mission teams and the communication team since the latter half of 2013, and this applies fully to the social media aspects. Working together, we have demonstrated the possibility and immense value of achieving global impact by providing live feeds and real-time social media reporting, even for — and perhaps especially for — high-risk events when the successful outcome of an activity is not certain. Exposing risk and vulnerability is part of human nature, and whatever the outcome, the emotional experience can be related to, be it tension, stress or the anxiety of an unknown situation, or the jubilation and joy of shared success for an achievement. This required the communication team to work alongside the mission operators to manage expectations in the build-up to key moments and also to be present during those key moments to ensure that the most accurate information could be provided directly, and translated immediately and effectively into social media updates (see Figure 4).

During the demanding periods of 24-hour coverage it was also necessary to share roles and responsibilities within the communication team to maintain the numerous social media accounts in shifts, having draft tweets and blog posts that could be adapted as required as each mission milestone was met (or not). With the communication team onsite with the sources of the information, robust information and



Figure 4. The lead author of this paper (lower left) was present in the control room and able to receive direct confirmation of *Rosetta*’s wake-up, in order to send the “Hello, World!” tweet immediately. Credit: ESA/J. Mai

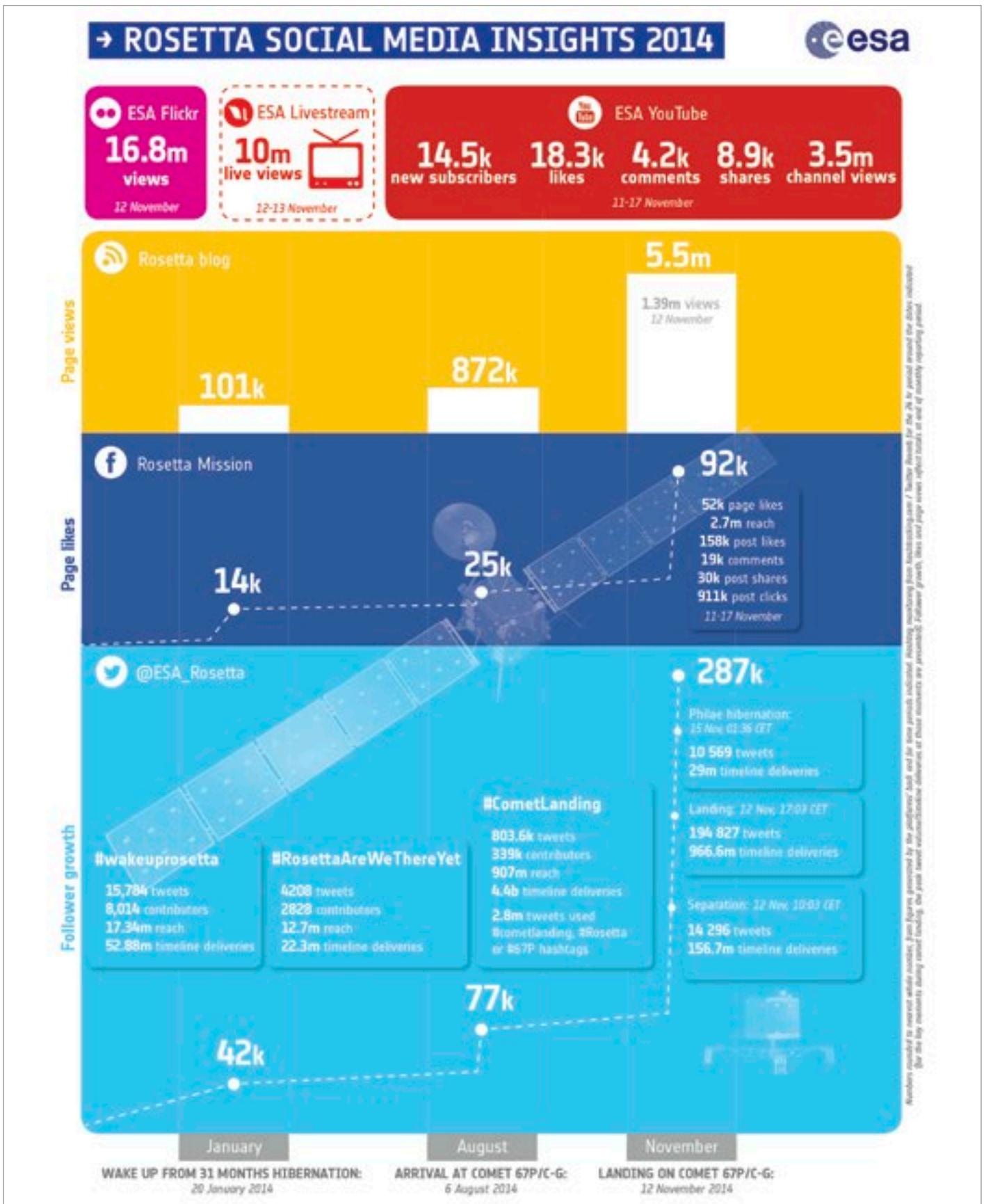


Figure 5. Graphic showing ESA social media insights from wake-up (January 2014) to comet landing (November 2014). Credit: ESA

approvals for sudden new material could easily be sought if and when the plan deviated from that which was originally foreseen.

The *Rosetta* mission accounts continue to attract new followers today (see Figure 5), keen to find the latest news, see the latest images, and follow the adventure as *Rosetta* continues its scientific mission at Comet 67P/C-G. Social media will remain a vital part of the mission right up until its end in September 2016, and the lessons learnt from the *Rosetta* social media campaigns will be of relevance to future ESA missions and other scientific communication campaigns.

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Notes

- ¹ *Rosetta* is an ESA mission with contributions from its member states and NASA. *Rosetta*'s *Philae* lander is provided by a consortium led by DLR, MPS, CNES, and ASI.
- ² ESA country desks are responsible for communication on all ESA programmes and activities in local national languages.
- ³ The *Rosetta* blog: <http://blogs.esa.int/rosetta>
- ⁴ The ESA Portal: <http://www.esa.int>
- ⁵ The ESA Science and Technology site: <http://sci.esa.int>
- ⁶ Emily Lakdawalla (@elakdawalla), Chris Lintott (@chrislintott) and Steven Young (@stevenyoungsfm) joined some of the ESA communicators to report as *Philae* completed science operations on the comet. See: <http://blogs.esa.int/rosetta/2015/11/17/remiscing-about-the-week-of-comet-landing/>
- ⁷ *Rosetta* Mission Facebook page: <https://www.facebook.com/RosettaMission/>

- ⁸ More information about Woobox can be found at: <http://woobox.com>
- ⁹ Rosettamission Instagram account: <https://www.instagram.com/rosettamission>
- ¹⁰ A full list of ESA's social media channels can be found here: http://www.esa.int/ESA/Connect_with_us
- ¹¹ Three pieces composed by Vangelis for *Rosetta* are available on YouTube: *Arrival* (<https://youtu.be/FJrUnzLsmZk>); *Philae's Journey* (<https://www.youtube.com/watch?v=W8bVOGN9jSg>); and *Rosetta's Waltz* (<https://www.youtube.com/watch?v=PUpSVxoCcik>)
- ¹² The esaoperations SoundCloud account: <https://soundcloud.com/esaops>
- ¹³ *The Singing Comet* can be heard on SoundCloud: <https://soundcloud.com/esaops/a-singing-comet>

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