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Collecting Works: A History of the Euler Archive

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Collecting Works: A History of the Euler Archive

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The Euler Archive was made possible by a confluence of technologies at the turn of the 21st century; in particular, the ability to generate scanned PDF files and post them online for widespread dissemination was still quite novel in 2002. Dominic Klyve and Lee Stemkoski, then graduate students at Dartmouth College, conceived of this idea in conversation with C. Edward Sandifer, then at Western Connecticut State University. With support from Erik Tou, Rachel Vale, Alison Setyadi, and others, Klyve and Stemkoski were able to leverage Dartmouth's access to original materials to create a new online repository of Euler's works.

At its creation in 2003, the Euler Archive boasted a mere 73 of Euler's 866 known works¹, with about two dozen English translations available.² Soon after, the Archive grew by leaps and bounds, with 78% of Euler's works posted by 2005. As of this writing, the Euler Archive now offers scanned PDFs for 97% of Euler's works, mostly in Latin and French. Equally impressive is the collection of English translations available via the site, which has now reached 25% of Euler's works. There are also many translations into other modern languages, including 72 works now available in German.

It is hard to overstate the importance of the Euler Committee (*Euler-Kommission*) of the Swiss Academy of Sciences to Euler scholarship. Since its founding in 1907, it has been publishing the collected works of Euler in several, edited scientific volumes. Known colloquially as the *Opera Omnia*, it consists of four series of volumes. The first three series (72 volumes total) contain Euler's books and papers and have almost all been completed. The first of these volumes was published in 1911, and the final volume is set to appear in 2021. The fourth series (9 volumes) contains Euler's correspondence and is also nearly finished. This comprehensive reference can be found in many academic libraries around the world. Because of the preeminent position of the *Opera Omnia* in the world of Euler research, it occupies an important place alongside the Euler Archive, and its scholarly contributions continue to be indispensable

¹ This number refers to the 866 works that were listed in Gustav Eneström's 1913 index.

² A further description of the Euler Archive's early years can be found in Klyve and Stemkoski's 2007 essay, "The Euler Archive: Giving Euler to the World," which appeared in [Euler At 300: An Appreciation](#), from MAA Press.

for Euler scholars. For this reason, its citation information has always been included for the items in the Euler Archive.

In 2011, Dartmouth turned over the duties of hosting the Euler Archive to the Mathematical Association of America (MAA), giving the Archive a prominent and stable national platform. At this point, the main administrative work of the Euler Archive shifted from obtaining scans of Euler's original writings to reviewing translations. The Archive's original site design meant that maintenance became more difficult as the Archive grew, and the administrative burdens of finding referees and coordinating reviews became more time-consuming. These changes, combined with the departures of Klyve and Stemkoski, meant that Tou was running a translation review service on his own.

Christopher Goff joined the project in September 2017. In addition to his interest in translating Euler, his employer, University of the Pacific, had also recently adopted Scholarly Commons as a way to highlight and preserve the scholarship of its faculty. In early 2018, Tou and Goff met with Michele Gibney, Pacific's librarian supporting faculty use of Scholarly Commons. Gibney built a new framework for the Euler Archive in Scholarly Commons while Tou and Goff worked to clean up the Archive's metadata as much as possible, filling in gaps and working towards consistency. In September of 2018, the initial migration of content from the MAA site to Pacific's Scholarly Commons took place.

Since then, Tou and Goff have continued to update links between the MAA site and the Pacific site. Given the MAA's distinguished role in promoting Euler scholarship, many historical and archival resources have remained on the MAA site while all of the metadata and scanned copies of Euler's works have moved to Scholarly Commons. To make sense of this shared site design, Tou coined a library-themed analogy: the [MAA site](#) is the Archive's "front desk" while [Pacific's site](#) is the Archive's "stacks." To cement the arrangement, a three-party Memorandum of Understanding was signed by the Euler Archive, the Pacific library, and Pacific's Mathematics department.

The New Euler Archive

Euler Archive enthusiasts may notice that the site now has more content than it did before, and in some cases better scans of the original documents have been added as well. Moreover, an effort is being made to collect open source originals and translations from other reputable websites and post them on the Archive. Many gaps in the metadata have been filled, and original publication data has been made more consistent.

In addition to adding new content, the Archive's existing content has been reorganized in a way that will make research easier for scholars. Nearly all original titles have been translated into English. The multiple historical efforts to catalog Euler's work (by Fuss, Eneström, and the *Opera Omnia* series) are all represented in the metadata. Many articles have brief summaries posted. While the Archive's default ordering is by Eneström number, we have also retained the ability to search by date written or by the journals in which Euler published his works.

Scholarly Commons Platform

The new Euler Archive is located at <https://scholarlycommons.pacific.edu/euler/>. While the site is hosted by University of the Pacific Libraries and has elements of that branding, the new site was

designed to be familiar to MAA users, with the landing page including the Archive’s original banner image. The sitemap layout was also organized to follow the previous iteration, to make the transition as simple as possible for long-time Euler Archive users.

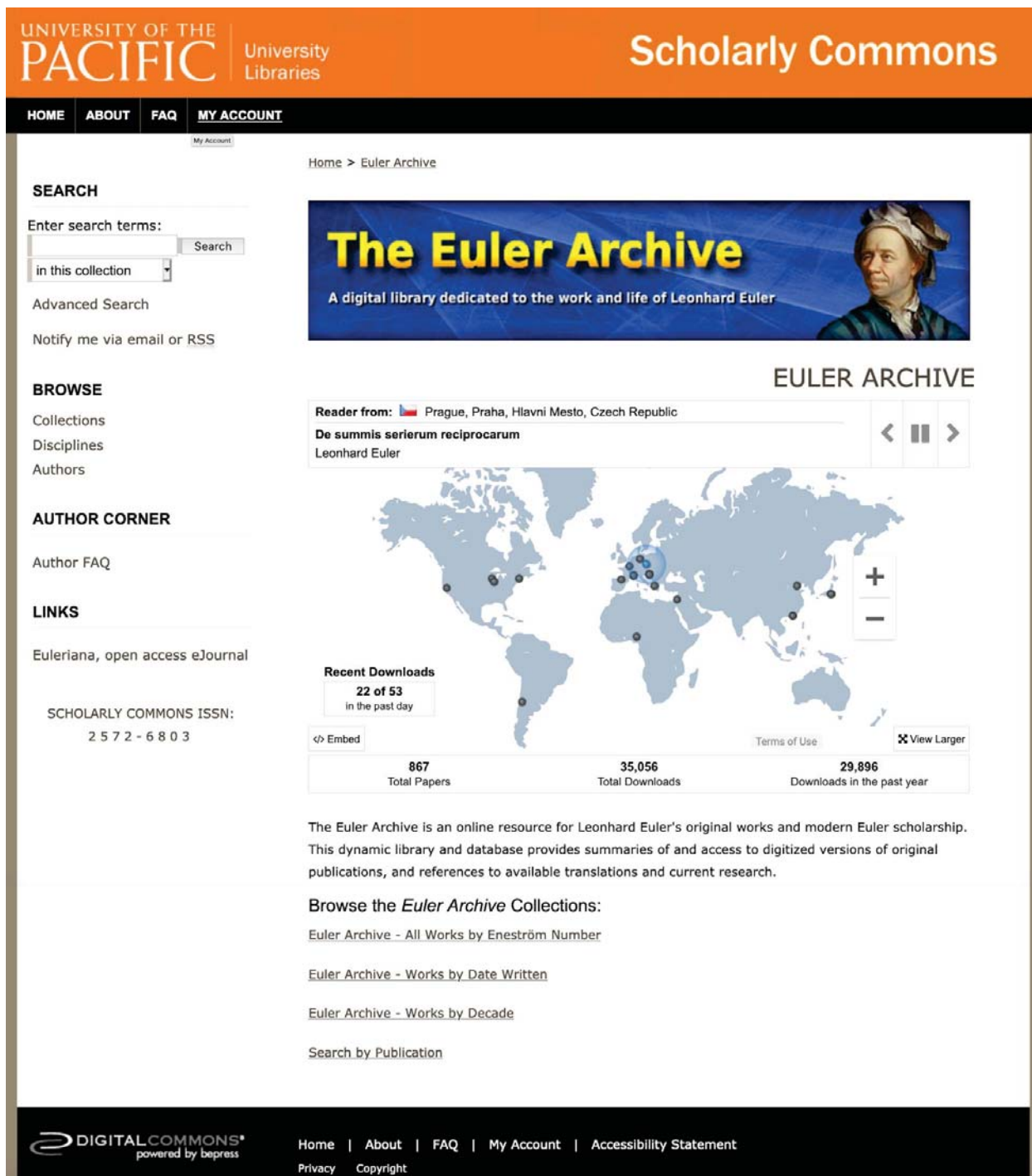


Figure 1. The Euler Archive landing page, at <https://scholarlycommons.pacific.edu/euler/>

Scholarly Commons is the online, institutional repository for University of the Pacific, launched in 2017. Online access is provided to both published and unpublished works by the University of the Pacific community. Contributions to the repository showcase the intellectual and creative output of University of the Pacific faculty, students, alumni and staff, ensuring long-term preservation and worldwide electronic accessibility. In addition to original knowledge in the form of several journals, conferences and open educational resources, Scholarly Commons also hosts special collections such as the Euler Archive. Special collections in the digital repository are meant to be used for research, teaching and learning purposes with the ultimate aim of leading to new, original published knowledge—such as in this journal, *Euleriana*!

Each record page in the Euler Archive has customized metadata based on what was included on the MAA pages, as well as some new information added during the data cleaning and migration process. The original, full-text file is available via a large, blue Download button on each page. If there are translations, they appear as supplemental content directly below the Download button as well as at the bottom of the page. For records where Euler Archive staff have not yet obtained a high quality scan of the original but one exists elsewhere on the Internet, the record will link to that version.

One of the benefits of the Scholarly Commons platform is that it affords the administrators of the Euler Archive access to a variety of usage statistics. Monthly usage reports show download activity the previous 30 days, which also include a link to the administrator Dashboard, where they can see an extensive amount of additional information. This includes a map that shows from where papers are being downloaded (even down to the granular level of institution/organization). There are several data visualizations with maps, institutions, countries, referrers, downloads over time, etc.

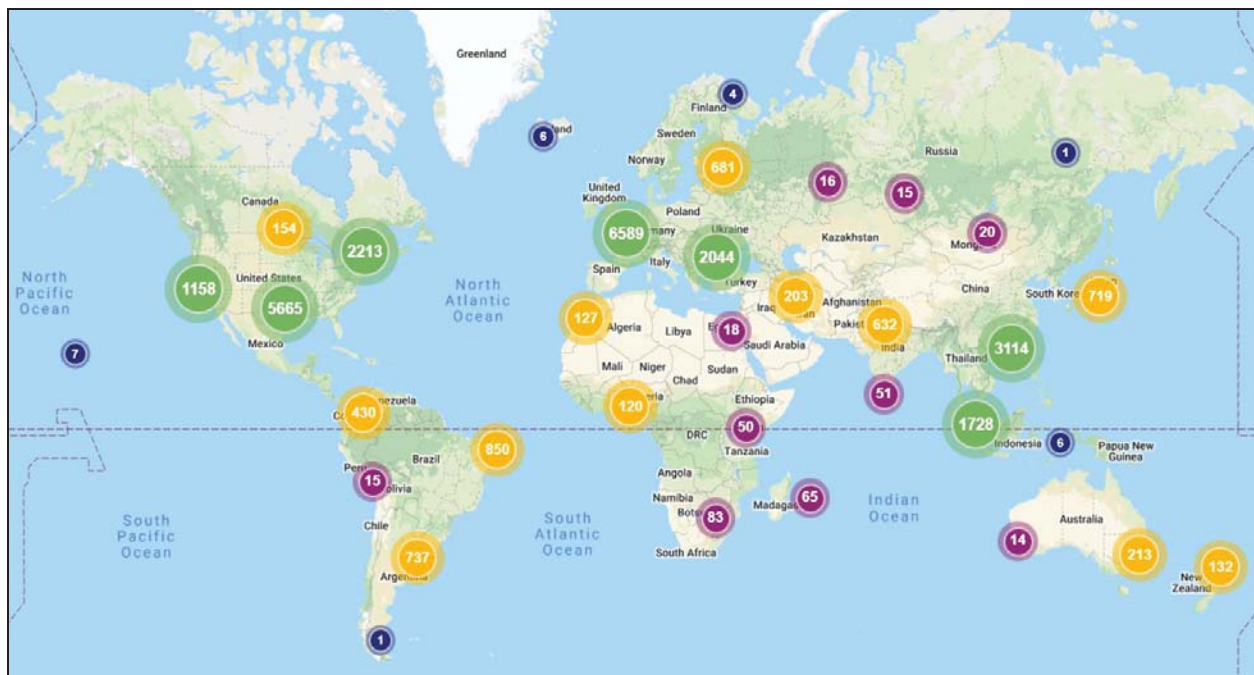


Figure 2. The Euler Archive readership distribution map, as of 14 December 2020.

Another new feature in Scholarly Commons is an embedded PlumX Snapshot. PlumX metrics are altmetrics—data captured about a record beyond the typical metrics of download/usage counts and citations. These include things such as social media posts, Mentions (blogs, news media, references) and Captures (bookmarked, favorites, exports). Details like this can assist the administrators in determining the overall interest level in the Archive. Alongside the downloads and citations, it also is very useful for gauging what Euler papers and topics are trending and what might be additional avenues to pursue in added content and future special issues of *Euleriana*.

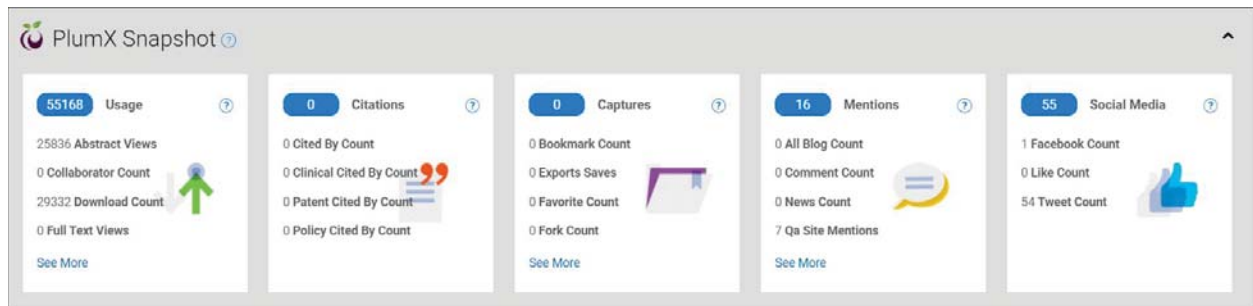


Figure 3. Euler Archive PlumX Snapshot, as of 14 December 2020.

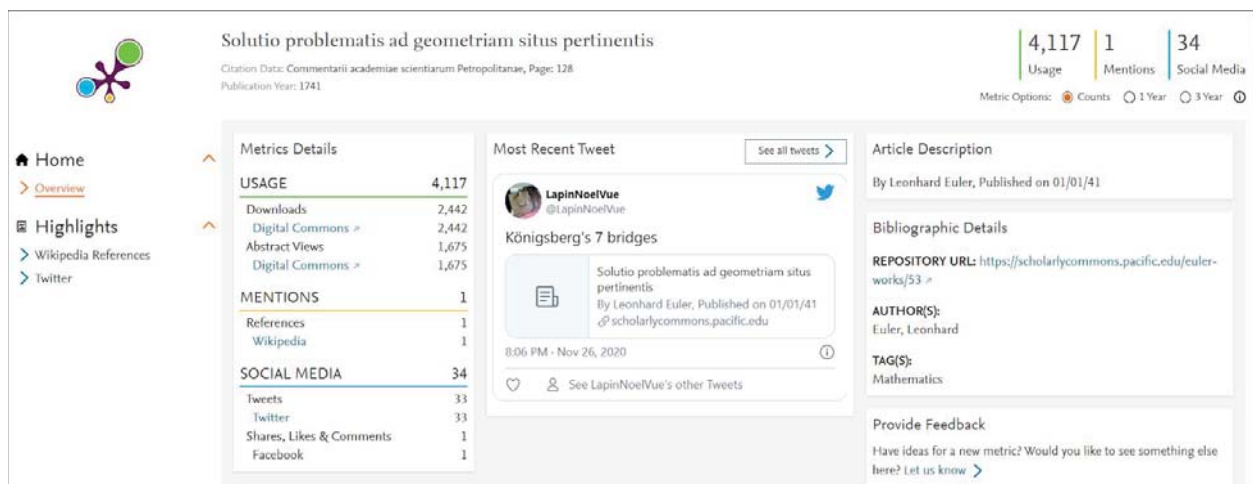


Figure 4. PlumX Snapshot of the most popular Euler Archive paper, “[Solutio problematis ad geometriam situs pertinentis](#)” [E53], as of 14 December 2020.

As an added level of discovery, all of the Euler Archive is harvested into the Elsevier Digital Commons Network, *Mathematics Commons*. The [Mathematics Commons](#) is an aggregated repository of over 19,000 full-text, open-access files with mathematical subject matter. Having the works harvested there can increase search engine optimization on the Euler Archive and increase traffic to the main repository.

Engaging with the Euler Archive

Because of its open-source nature, the Euler Archive encourages participation from scholars like you! Those who can read Latin can help by translating titles of Euler’s papers from Latin to English. Most have been translated already, but not all. Similarly, many of Euler’s works lack a brief summary paragraph

that can help researchers evaluate their content quickly. Scholars who can translate the languages that Euler published in—Latin, French, and German—can also provide complete translations into English. Many such translations may be publishable in journals such as *Euleriana*.

While much progress has been made in making the Euler Archive a robust source for primary source material on Leonhard Euler, there is still room for your participation. With collective effort, perhaps we can translate all of Euler's works by 2033, the 250th anniversary of his death. In the meantime, please visit the Archive and have a look around!