



Euler Society 2012 Meeting

July 23-25, 2012
Adelphi University
Garden City, New York



The Euler Society invites interested parties to submit proposals for its annual meeting. Presentations should relate to the work of Leonhard Euler or 18th century science. Those interested in attending or presenting at the meeting should contact Rob Bradley by postal mail or e-mail:

The Omnipresent Savant

By Dominic Klyve

**Español, Português, and Català:
Eulerian scholarship in modern Romance languages**

In a short 2011 article in MAA Focus [G], Fernando Gouvêa discussed the rising interest in the history of mathematics in Brazil. This reminded me of something I've been meaning to do for a long time: namely, write a column describing some of the recent scholarship done on Euler in some modern Romance languages. Most Eulerians read French, and the papers in French are reasonably well known throughout our society. Papers in other Romance languages, however, seem easier to miss. Part of this may be that fewer people read other languages, but I suspect that a big part of this is the simple fact that articles published in Iberia and South America have no natural place to be advertised in the United States.

In part through my own web surfing, and in part because the Euler Archive is a natural place for people to send notices and updates, I've come across several very good examples of Eulerian research in these languages over the last few years. In this column I simply want to share with the Euler Society some of what I've found.

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The conference registration fee is \$120, payable by cash or check (made out to the Euler Society). Euler Society membership dues are \$25. Fees should be sent to the following address:

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The deadline for abstracts is **May 31**; deadline for attendees is **June 11**. A reduced registration rate is available for those without institutional support. On-campus lodging is also available.

Updates and other information will be posted to the Euler Society web site:

<http://www.eulersociety.org>

A Trove of Translations

By Erik Tou

In recent years, the Euler Archive has served as an unofficial "clearing house" for translations of Euler's works. During the past year, the [translations page](#) has helped keep a record of completed translations, and translations in progress.

While the majority of these translations are being done in the English language, many non-English translations are becoming available as well. Some of this is due to the simple fact that scholars are conducting their work in their native languages—Dominic Klyve's current column explores a handful of works in Iberia and South America.

In addition to this, however, is the work of translators—people whose primary goal is to render Euler's works in a modern language other than the original. In this issue, I would like to highlight the amazing productivity of Artur Diener and Alexander Aycock, who as of this printing have translated 20 of Euler's works from Latin into German.

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The Euler Line

An Eulerian Tour in London

In "Spotting symmetry in the sky-scrapers," a recent article in the [New Scientist](#), Features editor Richard Webb describes a novel new urban tour company—[Maths in the City](#). The London tour begins with an explanation of the famous Bridges of Königsberg problem, solved by Euler in *Solutio problematis ad geometriam situs pertinentis* [E53] in 1735. The Millennium Bridge is also part of the tour—including an explanation of why the bridge swayed so dramatically upon opening (causing a temporary closure).

Tours are currently available in Oxford and London, and the [Maths in the City](#) web site has a blog on which users around the world can post interesting mathematical observations about their own cities.

Vladimir Shiltsev has published a paper in the February issue of [Physics Today](#), "[Mikhail Lomonosov and the dawn of Russian science](#)". In this paper, Shiltsev tracks Lomonosov's life and career, from his early days in far northern Russia to his time as a professor of physics at the St. Petersburg Academy. Interestingly, Lomonosov's tenure at the academy (1741-1765) was almost the polar opposite of Euler's.



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Since the Gouvêa article motivated this column, let's start with Brazil. Brazilian work in the history of mathematics is a bit difficult to search, but it seems to be getting easier. Certainly several of the presentations at Brazil's recent conference on the history of mathematics (*O IX Seminário Nacional de História da Matemática*) discussed Euler's work. Much like our own Joint Math Meetings, many of these talks were general surveys, and contain little that is not already available in other secondary literature. (Please note that I do not mean this disparagingly—I myself have learned a great deal from conference talks which expound, explain, or summarize existing literature.)

Some of these talks are available as longer manuscripts. Worth a look are da Silva Cota and Fossa's *Alguns Aspectos Históricos da Investigação de Leonhard Euler sobre os Números Pentagonais* [C&F] (*Some Historical Aspects of Leonhard Euler's Investigation of the Pentagonal Numbers*). For those without the motivation to read Jordan Bell's definitive history [B], this paper presents a nice outline of Euler's work (while citing Bell). Of much more interest to me, however, was a paper by Dantas and Fossa on [E29](#): *Primeiro Trabalho de Euler sobre Equações Diofantinas*.

As the title of their paper suggests, E29 is Euler's first work in Diophantine Equations. It's been translated into English by Danny Otero, and Ed Sandifer has explained some of its mathematics in [The Early Mathematics of Leonhard Euler](#). Because there was no detailed treatment of E29, however, one of my students is attempting to write one for his undergraduate honors thesis. I was therefore a bit disappointed, but also quite impressed, by the excellent exegesis of Dantas and Fossa. Even more exciting was the bibliography to this paper, which points out that Dantas has done a much more complete description of Euler's work for his master's thesis.

In short, the work of the modern Brazilian historians deserves to be better known. The [Comunicações](#) (the written papers) from the last conference are available online, and are well worth a look. (Most, for what it's worth, have English abstracts).

Moving across the ocean, I've been surprised to discover that there is a large research center in the history of science in Barcelona. Researchers there pursue several different subfields of history, and the history of mathematics is well represented. I'm not sure how Euler became a popular topic in Barcelona. At the end of book 2 of his translation of Euler's *Introductio*, John Blanton mentions Professor Albert Dou i Mas de Xexàs, S.J., who had translated several of Euler's works into Spanish. According to his [Wikipedia biography](#), Dou came from a noble family, was a Jesuit, and died in 2009. He taught at several universities, and worked with NASA on the Apollo missions. There is a street in Barcelona named for him. He was very active in

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Because of their efforts, many previously inaccessible papers (at least to those without a background in Latin) can now be found on the Euler Archive. A listing of these articles is provided below.

I. Articles not available in any other modern language

- *Solutio problematum reactivationem ellipsis requirentium* [E52]
- *Theorematum quorundam arithmetorum demonstrationes* [E98]
- *Theoremata arithmetica nova methodo demonstrata* [E271]
- *Nova series infinita maxime convergens perimetrum ellipsis exprimens* [E448]
- *De miris proprietatibus curvae elasticae sub aequatione*

$$y = \int (xx \, dx) / \sqrt{(1-x^4)}$$
contentae [E605]
- *Speculationes super formula integrali*

$$\int (x^n \, dx) / \sqrt{(aa - 2bx + cxx)},$$
ubi simul egregiae observationes circa fractiones continuas occurrunt [E606]
- *Evolutio formulae integralis*

$$\int dx (1/(1-x) + 1/(lx))$$
a termino $x = 0$ ad $x = 1$ extensae [E629]
- *Nova demonstratio, quod evolutio potestatum binomii Newtoniana etiam pro exponentibus fractis valeat* [E637]
- *De termino generali serierum hypergeometricarum* [E652]
- *Specimen transformationis singularis serierum* [E710]
- *Disquisitiones analyticae super evolutione potestatis trinomialis $(1+x+xx)^n$* [E722]
- *Demonstratio insignis theorematis numerici circa uncias potestatum binomialium* [E726]

II. Articles with more than one available translation

- *De seriebus divergentibus* [E247]
- *Annotationes in locum quendam Cartesii ad circuli quadraturam spectantem* [E275]
- *Evolutio producti infiniti*

$$(1-x)(1-xx)(1-x^3)(1-x^4)(1-x^5) \text{ etc.}$$
in seriem simplicem [E541]
- *De transformatione seriei divergentis*

$$1 - mx + m(m+n)x^2 - m(m+n)(m+2n)x^3 + \text{etc.}$$
in fractionem continuam [E616]
- *Observationes generales circa series, quarum termini secundum sinus vel cosinus angulorum multiplosum progrediuntur* [E655]
- *Variae considerationes circa series hypergeometricas* [E661]
- *Methodus succincta summas serierum infinitarum per formulas differentiales investigandi* [E746]
- *Commentatio in fractionem continuam, qua illustris La Grange potestates binomiales expressit* [E750]

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the history of mathematics, but I can locate only one paper of his about Euler—a translation and commentary on his method of maxima and minima [D93].

Perhaps Dou helped launch Euler studies in Barcelona; perhaps not. Certainly interest in Euler has grown there over time, however, driven largely (and fascinatingly) by the department of the history of engineering. This interest culminated recently in a large tercentennial conference, the “Congrés Internacional sobre Leonhard Euler.” What is most important about this conference, for American members of the Euler Society, is that a recent issue of the *Quaderns d'història de l'enginyeria* (Journal of the history of engineering) is completely devoted to Euler. This issue (Volume 9) contains fifteen new articles about Euler. For the large part, these are well done, interesting, and of high scholarly caliber.

It is only fair to note that a few of these articles are unusual in a certain way. Consider the first sentence of an article comparing Euler's unpublished *Tractatus* (E792) with Gauss's *Disquisitiones*:

El text manuscrit de Leonhard Euler, *Tractatus de numerorum doctrina capita sedecim quae supersunt* [*Tractat de la doctrina dels nombres, exposada en setze capítols*] fou escrit, molt probablement entre els anys 1748 i 1750, i publicat a *Commentationes Arithmeticae*, volum segon, Ginebra 1849, 503–575, essent-ne l'editor Rudolf Fueter.

The first few words of this article are easy enough to read, but the first time I read this, I became increasingly confused as the sentence went on. This clearly isn't Spanish. Nor is it Portuguese. Indeed this article, together with four others from this volume, is in Catalan!

When people list modern Romance languages, Catalan doesn't usually get included. But with roughly ten million speakers worldwide, it remains a vigorous and widely-spoken language, primarily in Andorra, the regions of Spain and France near Andorra, and on the island of Sardinia. These regions include Catalonia in Spain, which itself includes Barcelona. Thus it is that 95% of the residents of Barcelona, Spain's second-largest city, speak or understand Catalan, and it is reasonable to allow talks and papers given in Barcelona to be in Catalan, despite the fact that it makes reading the papers by an international audience more difficult.

We should turn our attention back to journal, however, and the publication of the conference proceedings. Its articles are in Catalan, Spanish, and English, and include studies of Euler's work in music theory, calculus, analytic geometry, number theory, and rigid bodies, together with works which less directly concern Euler's mathematics: a study of his relationship with the Jesuits in Russia, a general discussion of mathematical theory and naval practice in the Enlightenment, and a very nice essay on Johann Albrecht Euler's work on windmills and comets.

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Conveniently, [English abstracts](#) of all of these articles are available. Read them!

Work in Spain of interest to Euler historians is not limited, however, to Barcelona. One of my favorite writers is Juan Arana—an expert in seventeenth and eighteenth century philosophy, who teaches at the University of Seville. He has been writing about Euler for almost twenty years, dating back to his 1994 book *La mecánica y el espíritu: Leonhard Euler y los orígenes del dualismo contemporáneo* (The mechanics and the spirit of Leonhard Euler and the origins of contemporary dualism) [A1]. His work in eighteenth century natural philosophy covers a great deal of Euler's work, and (conveniently) includes a lot of material not studied by many members of English-speaking academia in the United States. Consider the following partial list of his publications:

- *La doble significación científica y filosófica de la evolución del concepto de fuerza de Descartes a Euler* (The scientific and philosophical double meaning of the evolution of the concept of force from Descartes to Euler).
- *Euler y el concepto de materia*, (Euler and the concept of matter)
- *Los científicos de la Ilustración como apologistas del Cristianismo: Albrecht von Haller y Leonhard Euler* (Scientists of the Enlightenment as Christian Apologists: Albrecht von Haller and Leonhard Euler)

And, of deep interest to me, the only detailed published commentary I know of in any language on Euler's *Rettung* ([E91](#)):

- Traducción e introducción a: Leonhard Euler, «Defensa de la revelación divina contra las objeciones del librepensador», *Thémata*, núm. 8, 1991, pp. 195-219. [A2]

Arana's reading is deep, and he draws on primary and secondary sources from across the languages of Europe. It is a pity that his works are not available in English, but they are still worth seeking out.

And did I mention that all of these are available for free on his [web page](#)?

In the article that inspired this column, Gouvêa points out the national character of research is not just due to language differences. The goals and methods of the scholars writing in Romance languages may differ someone from those of U.S. scholars, say. Given the vast amount of Euler's work which is not yet summarized, discussed, or well understood in English, however, we ignore these works only at cost to ourselves.

— D. Klyve

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Letters, articles, and other contributions to *Opusculum* are very welcome. Send any contributions, observations, or news items to Erik Tou at etou@carthage.edu.

The mission of The Euler Society is three-fold: It encourages scholarly contributions examining the life, research, and influence of Euler. The Society also explores current studies in the mathematical sciences that build upon his thought. And it promotes English translations of selections from his writings, including correspondence and notebooks.

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