

Euler Returns to Adelphi

The Euler Society Executive Committee is pleased to announce that annual conference of our society is returning to Adelphi University in Garden City, New York in 2010! Many readers will remember the successful 2008 conference at Adelphi, and we look forward to an even better meeting next year. The conference will run from Monday, July 19 to Wednesday, July 21. Dormitory rooms will be available for the duration of the conference, beginning on Sunday, July 18.

This will be the 9th meeting of the Society, and expectations are high! Registration will begin in the coming months, so be ready to add yourself to the growing list of E2k+10 attendees. Since a successful conference relies on the attendance of Eulerphiles, you are encouraged to spread the word about this exciting event as we begin advertising.

Details about registration and membership costs, contact information, and abstracts will follow in the Spring 2010 issue of *Opusculus*. For now, save the date!

The Omnipresent Savant

By Dominic Klyve

On Citing Euler's Works

I have seen Euler's works cited in dozens of books and journal articles, and it sometimes seems that each has author has their own way to cite Euler's original work. I've most commonly seen the following four methods:

1. The original source (e.g., the *Commentarii*) – this, sadly, is the rarest;
2. A later reprinting (the most common is probably the *Commentationes Arithmeticae*);
3. A modern translation;
4. A secondary source (usually a history of mathematics textbook).



The Euler Society 2010 Conference will be at Adelphi University, Garden City, New York, July 19–21.

Clearly this range of options cries out for a solution. How ought Euler be cited? We need ask ourselves: what is the purpose of scholarly citation? The practice is, after all, quite a bit younger than scholarship itself. Euler himself occasionally cited or referenced other sources, but more often than not his citations were vague, uncertain things. I would claim that the reasons for citing other works in our scholarship are (in rough order of importance):

1. To give credit to the person who originally created the work (and the organization that published it);
2. To enable the reader to find the original source, that they might check the work for themselves;
3. To provide a way to calculate the importance of the original work (a citation index measures the number of times a work has been cited: the more often this has happened, the more important it must be).

Klyve, continued on Page 9

The Euler Line

Dispatches from the world
of Euler scholarship



1. **Craig Fraser** of the University of Toronto has recently reviewed Rüdiger Thiele's book, *Von der Bernoullischen Brachistochrone zum Kalibrator-Konzept (From the Bernoullis' Brachistochrone to the Concept of Function)*. Fraser's article, "Sufficient conditions, fields and the calculus of variations," has been published online via *Historia Mathematica*. A copy of the review is also available on Fraser's own web site:

<http://chass.utoronto.ca/~cfraser/Thielereview.pdf>.

2. **Lokenath Debnath** at the University of Texas — Pan American has published a paper, "The legacy of Leonhard Euler — a tricentennial tribute," in the *International Journal of Mathematical Education*. The article appears in Volume 40, Issue 3 (January 2009).

3. *Leonhard Euler and the Bernoullis*, **M.B.W. Tent's** new book chronicling the history of the Bernoulli family and its connections to Euler, has been published this year by A K Peters. The book is available for purchase via Amazon.com, and limited page previews are available on Google Books.

4. **Tonny Clayton D. O. Peres** has published a paper, "Leonhard Euler: O Matemático Mais Prolífico da História" ("Leonhard Euler: The Most Prolific Mathematician in History"), in *Diálogos & Saberes*. This paper surveys Euler's life and work, covering several mathematical highlights from Euler's career. It is also written in Portuguese, so translations and/or commentary by experts are welcome.

5. A paper by **John Brillhart** of the University of Arizona appears in the December 2009 issue of the *American Mathematical Monthly*. The paper, *A Note on Euler's Factoring Problem*, examines Euler's work on the Fermat $4n+1$ problem, namely, that any prime of the form $4n+1$ can be expressed as the

sum of two squares in exactly one way. Brillhart cites only secondary sources, though some primary source materials (via Dickson's *History of the Theory of Numbers*) are: two letters from the Euler-Goldbach correspondence (**OO801** and **OO829**), **E228**, and **E369**. Another of Euler's papers on this subject, **E241** (*Demonstratio theorematis Fermatiani omnem numerum primum formae $4n+1$ esse summam duorum quadratorum*), is also a good reference.

Klyve, Continued from Page 8

One problem here is that these goals can be mutually contradictory. Giving credit to the original source requires that we give, well, the original source. But often this source is hard to find, and a later reprinting will help a reader check a source more easily. We could try to correct for this by citing every printing and edition of a work that has yet appeared, but this is surely overkill. What, then, to do?

I would like here to propose a standard for citing Euler's works. It is not a completely original standard — it's inspired by Ed Sandifer's citations in his *How Euler Did It* series. Despite the fact that he's been writing the series for almost seven years, however, his style has not caught on. I hope that this column will push things forward, and accomplish through strong urging what mere "leading by example" has not.

The new proposed standard for citing Euler's works looks like this:

<author>, <title> (<Eneström number>). <Original publication info>. Reprinted in <Opera Omnia publication info>. Original [article/book] available online [with an English translation by <name>] at <online source>.

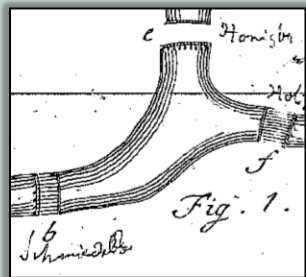
Here the angled brackets indicate that the writer should fill in the appropriate information, and the square brackets are optional. In order to make things clearer, I offer an example:

L. Euler, De mirabilibus proprietatibus numerorum pentagonalium (E542). *Acta Academiae Scientiarum Imperialis Petropolitinae* (1780), pp. 56–75. Reprinted in *Opera Omnia*: Series 1, Vol. 3, pp. 480–496. Original article available online, along with an English Translation by Jordan Bell, at www.eulerarchive.org.

Klyve, Continued on Page 10

On the Euler Circuit

Recent seminars and colloquia on Euler



In late September/early October, **Rüdiger Thiele** presented a mini-course of 12 lectures at Brigham Young University in Provo, Utah. Topics included the change from geometrical to analytical thinking in mathematics during the Enlightenment, Euler and the analytical function concept, and Fourier series. These lectures were bookended by two general colloquia, beginning with "Why history of mathematics?" and ending with "What is an analytical function?".

Thiele also presented a related lecture at Ramapo College of New Jersey: "Did the Greeks know real numbers?"

Betty Mayfield of Hood College presented "Women and Mathematics in the Time of Euler" at Eastern Pennsylvania/Delaware MAA Section meeting on November 7 of this year.

Dr. Mayfield's presentation included a review of some female contemporaries of Leonhard Euler, and also the mathematics that was written both by and for women during the 18th century.

Dr. Mayfield is also the current First Vice-President of the MAA.

Klyve, Continued from Page 9

This is perhaps longer than it strictly needs to be, but not much, and it answers all the major questions we could ask. We know the original information. The Eneström number gives us a master index to compare different citations. The Opera Omnia gives us a clean, edited version available via Inter-Library Loan, and the Euler Archive mention tells us whether the paper is available for free with any laptop. All of this information is readily available at the Euler Archive, so writing the citations should prove to be of little difficulty. This modest suggestion, even if universally adopted, will not change the world, but it will make Eulerian scholarship easier, and will almost certainly bring other scholars closer to Euler's original works.

— D. Klyve

Special Translation Notice

Enlin Pan has recently completed a translation of **E447**, a paper with the following, daunting title:

$$\begin{aligned} & \textit{Summatio progressionum} \\ & \sin(\varphi^\lambda) + \sin(2\varphi^\lambda) + \sin(3\varphi^\lambda) + \dots + \sin(n\varphi^\lambda); \\ & \cos(\varphi^\lambda) + \cos(2\varphi^\lambda) + \cos(3\varphi^\lambda) + \dots + \cos(n\varphi^\lambda). \end{aligned}$$

This paper starts like **E246** with the substitutions of u and v into an infinite series; they diverge if $\lambda > 1$. As Enlin Pan points out in his commentary, though, there is more going on here. Before the paper is over, Euler generalizes the notion of limit, and comes quite close to developing basic ideas of Fourier series and Cesaro sums.

This translation is currently available via the Euler Archive: <http://www.eulerarchive.org>.

F Minus



© 2009 Tony Carillo

Distributed by United Feature Syndicate, Inc.

Reprinted with permission.

Translation and Archive Update

Ralf Krömer of Universität Siegen has translated E230 (*Elementa doctrinae solidorum*) and Euler's sequel, E231 (*Demonstratio nonnullarum insignium proprietatum*), into German. Both are new as German translations, and the translation of E230 is currently the only known translation into any language.

Tom Osler and **Jasen Scaramazza** of Rowan University have translated E105 (*Memoire sur la plus grande equation des planetes*) into English. This paper, published by Euler in the *Berlin Mémoires* for 1748, explores the apparent irregularities of planetary motion beginning with Kepler's laws of planetary motion. A detailed synopsis accompanies the translation.

Jasen Scaramazza of Rowan University has recently completed a translation of E314 (*Conjecture sur la raison de quelques dissonances généralement reçues dans la musique*) into English. This paper, published in the *Berlin Mémoires* for 1766, is an analysis of the physical and mathematical underpinnings of dissonance. This is one of Euler's few works on music theory.

Google Books has recently become an important source of Euler's original work and out-of-print translations. The Euler Archive does attempt to provide reasonably current links from its site, but lately the rate that new works are being added has made this difficult. Below is a partial list of what's available on Google Books; you are also encouraged to go look for yourself!

- The 1898 book, *Drei Abhandlungen über Kartenprojection*, is currently available. This book is a German translation of E490-492, which consists of Euler's work on map projections.
- The 1896 book, *Zwei Abhandlungen über sphärische Trigonometrie*, is also available. The first part of this book consists of Euler's E214 (*Prinipes de la trigonometrie spherique tires de la methode des plus grands et plus petits*).

Special note: If anyone knows the source of the material beginning on page 40, the staff of the Euler Archive would *love* to know. The Google Books link is:

<http://books.google.com/books?id=dPbhs0MSJOgC&pg=PA40>

- Lastly, several selections from *Letters to a German Princess* are also available on Google Books.

The documents mentioned in this column are available via the Euler Archive: <http://www.eulerarchive.org>.

Opusculus is the official newsletter of the Euler Society. It is published on a quarterly basis.

Opusculus Staff & Volunteers

Erik R. Tou, Editor

Dominic Klyve, Contributor

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

The mission of *The Euler Society* is threefold: 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.

Euler Society Executive Committee

Ronald S. Calinger, Chancellor
Catholic University of America
calinger@cua.edu

Robert E. Bradley, President
Adelphi University
bradley@adelphi.edu

Rüdiger Thiele, Vice President
University of Leipzig
ruediger.thiele3@freenet.de

C. Edward Sandifer, Secretary
Western Connecticut State University
esandifer@earthlink.net

Erik R. Tou, Treasurer
Carthage College
etou@carthage.edu

John S. D. Glaus, Ombudsman
The Euler Society
restinn@roadrunner.com

Dominic Klyve, Webmaster
Carthage College
dklyve@carthage.edu

Lee Stemkoski, ex-officio
Adelphi University
stemkoski@adelphi.edu

www.eulersociety.org