COMMENTARY

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The year 2007 is the 300th anniversary of Leonhard Euler's birth. This issue of the *Bulletin* is dedicated to celebrating Euler's iconic status in mathematics. The depth, breadth, beauty, importance and shear quantity of his mathematics and science is phenomenal. It is probably safe to say that every mathematician today is influenced by work of Euler.

This issue contains six survey articles describing different areas in which Euler's work was fundamental. These articles touch upon original contributions of Euler, which in all cases broke new ground in crucial ways. Each article contains a discussion of certain lines of development of modern mathematics and physics for which Euler's work was seminal. These topics are very diverse.

- V.S. Varadarajan outlines Euler's work on infinite series and its modern outgrowths.
- B. Totaro considers two main themes in algebraic geometry that descend from Euler's work, namely Hodge Theory and birational geometry.
- G. Andrews surveys the impact of Euler's "De Partito Numerorum" on the study of partitions.
- H. Edwards examines Euler's definition of the derivative in the context of the concept of a function introduced by Euler.
- D. Christodoulou introduces the Euler equations for compressible fluids and connects this with the Minkowski space-time framework of special relativity.
- P. Constantin discusses the Euler equations of incompressible fluids. This year is the 250th anniversary of the publication by Euler of these equations at the Berlin Academy. They mark the emergence of the modern style of mathematical physics. They remain to this day the source of some of the most challenging open problems in partial differential equations.

A relatively small number of articles can only skim the surface of Euler's immense output. Our goal is only to illustrate his amazing creativity and achievements. Euler's collected works and correspondence are still in the process of being edited and stand at over 31,000 pages! He was a mathematician "par excellence". He was also keenly involved in the practical science of his times, from his second published paper (at age 20) on oscillations of air in a flute to his work on balloon flight in 1783 (the year of his death) after having just learned of the first manned ascent in a balloon. In the years between he laid the foundations for much of modern mathematics.

The Mathematical Perspectives section of this issue continues the Euler theme in an informal vein. G. Alexanderson writes a short article about Euler's celebrated masterpiece, "Introductio in analysin infinitorum". The frontispiece of this book

is a beautifully decorated work of engraving. We have used this engraving as the background "wash" for the cover of this Euler issue of the *Bulletin*. We also present four Mathematical Reviews by C. Scriba which discuss a small subset of the editions that have been produced concerning Euler's collected works and correspondence. Finally, you will find Terence Tao's contribution to our "What is good mathematics" series, invited for inclusion in this Euler issue of the *Bulletin*.

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