Leonhard Euler And The Bernoullis Mathematicians From Basel

The 18th century was a wealth of knowledge, exploration and rapidly growing technology and expanding record-keeping made possible by advances in the printing press. In its determination to preserve the century of revolution, Gale initiated a revolution of its own: digitization of epic proportions to preserve these invaluable works in the largest archive of its kind. Now for the first time these high-quality digital copies of original 18th century manuscripts are available in print, making them highly accessible to libraries, undergraduate students, and independent scholars. Medical theory and practice of the 1700s developed rapidly, as is evidenced by the extensive collection, which includes descriptions of diseases, their conditions, and treatments. Books on science and technology, agriculture, military technology, natural philosophy, even cookbooks, are all contained here. ++++ The below data was compiled from various identification fields in the bibliographic record of this title. This data is provided as an additional tool in helping to insure edition identification: ++++ British Library T099892 First published in German 'Vollständige Anleitung zur Algebra'. London: printed for J. Johnson, 1797. 2v., plate; 8°

As Eugene Wigner stressed, mathematics has proven unreasonably effective in the physical sciences and their technological applications. The role of mathematics in the

biological, medical and social sciences has been much more modest but has recently grown thanks to the simulation capacity offered by modern computers. This book traces the history of population dynamics---a theoretical subject closely connected to genetics, ecology, epidemiology and demography---where mathematics has brought significant insights. It presents an overview of the genesis of several important themes: exponential growth, from Euler and Malthus to the Chinese one-child policy; the development of stochastic models, from Mendel's laws and the question of extinction of family names to percolation theory for the spread of epidemics, and chaotic populations, where determinism and randomness intertwine. The reader of this book will see, from a different perspective, the problems that scientists face when governments ask for reliable predictions to help control epidemics (AIDS, SARS, swine flu), manage renewable resources (fishing quotas, spread of genetically modified organisms) or anticipate demographic evolutions such as aging.

The year 2007 marks the 300th anniversary of the birth of one of the Enlightenment's most important mathematicians and scientists, Leonhard Euler. This volume is a collection of 24 essays by some of the world's best Eulerian scholars from seven different countries about Euler, his life and his work. Some of the essays are historical, including much previously unknown information about Euler's life, his activities in the St. Petersburg Academy, the influence of the Russian Princess Dashkova, and Euler's philosophy. Others describe his influence on the subsequent growth of European

mathematics and physics in the 19th century. Still others give technical details of Euler's innovations in probability, number theory, geometry, analysis, astronomy, mechanics and other fields of mathematics and science. - Over 20 essays by some of the best historians of mathematics and science, including Ronald Calinger, Peter Hoffmann, Curtis Wilson, Kim Plofker, Victor Katz, Ruediger Thiele, David Richeson, Robin Wilson, Ivor Grattan-Guinness and Karin Reich - New details of Euler's life in two essays, one by Ronald Calinger and one he co-authored with Elena Polyakhova - New information on Euler's work in differential geometry, series, mechanics, and other important topics including his influence in the early 19th century

The mathematical methods employed by Newton in the Principia stimulated much debate among contemporaries. This book explains how Newton addressed these issues, taking into consideration the values that directed his research. It will be of interest to researchers and students in history and philosophy of science, physics, mathematics and astronomy.

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Galileo Unbound traces the journey that brought us from Galileo's law of free fall to today's geneticists measuring evolutionary drift, entangled quantum particles moving among many worlds, and our lives as trajectories traversing a health space with thousands of dimensions. Remarkably, common themes persist that predict the evolution of species as readily as the orbits of planets or the collapse of stars into black

holes. This book tells the history of spaces of expanding dimension and increasing abstraction and how they continue today to give new insight into the physics of complex systems. Galileo published the first modern law of motion, the Law of Fall, that was ideal and simple, laying the foundation upon which Newton built the first theory of dynamics. Early in the twentieth century, geometry became the cause of motion rather than the result when Einstein envisioned the fabric of space-time warped by mass and energy, forcing light rays to bend past the Sun. Possibly more radical was Feynman's dilemma of quantum particles taking all paths at once — setting the stage for the modern fields of quantum field theory and quantum computing. Yet as concepts of motion have evolved, one thing has remained constant, the need to track ever more complex changes and to capture their essence, to find patterns in the chaos as we try to predict and control our world.

Ioan James introduces and profiles sixty mathematicians from the era when mathematics was freed from its classical origins to develop into its modern form. The subjects, all born between 1700 and 1910, come from a wide range of countries, and all made important contributions to mathematics, through their ideas, their teaching, and their influence. James emphasizes their varied life stories, not the details of their mathematical achievements. The book is organized chronologically into ten chapters, each of which contains biographical sketches of six mathematicians. The men and women James has chosen to portray are representative of the history of mathematics,

such that their stories, when read in sequence, convey in human terms something of the way in which mathematics developed. Ioan James is a professor at the Mathematical Institute, University of Oxford. He is the author of Topological Topics (Cambridge, 1983), Fibrewise Topology (Cambridge, 1989), Introduction to Uniform Spaces (Cambridge, 1990), Topological and Uniform Spaces (Springer-Verlag New York, 1999), and co-author with Michael C. Crabb of Fibrewise Homotopy Theory (Springer-Verlag New York, 1998). James is the former editor of the London Mathematical Society Lecture Note Series and volume editor of numerous books. He is the organizer of the Oxford Series of Topology symposia and other conferences, and co-chairman of the Task Force for Mathematical Sciences of Campaign for Oxford.

Euler was not only by far the most productive mathematician in the history of mankind, but also one of the greatest scholars of all time. He attained, like only a few scholars, a degree of popularity and fame which may well be compared with that of Galilei, Newton, or Einstein. Moreover he was a cosmopolitan in the truest sense of the word; he lived during his first twenty years in Basel, was active altogether for more than thirty years in Petersburg and for a quarter of a century in Berlin. Leonhard Euler’s unusually rich life and broadly diversified activity in the immediate vicinity of important personalities which have made history, may well justify an exposition. This book is based in part on unpublished sources and comes right out of the current research on Euler. It is entirely free of formulae as it has been written for a broad audience with interests in the history of culture and science.

"Part I reprints and reworks Huygens's On Reckoning in Games of Chance. Part II offers a

thorough treatment of the mathematics of combinations and permutations, including the numbers since known as "Bernoulli numbers." In Part III, Bernoulli solves more complicated problems of games of chance using that mathematics. In the final part, Bernoulli's crowning achievement in mathematical probability becomes manifest he applies the mathematics of games of chance to the problems of epistemic probability in civil, moral, and economic matters, proving what we now know as the weak law of large numbers."

The positive response to the publication of Blanton's English translations of Euler's "Introduction to Analysis of the Infinite" confirmed the relevance of this 240 year old work and encouraged Blanton to translate Euler's "Foundations of Differential Calculus" as well. The current book constitutes just the first 9 out of 27 chapters. The remaining chapters will be published at a later time. With this new translation, Euler's thoughts will not only be more accessible but more widely enjoyed by the mathematical community.

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From the preface of the author: "...I have divided this work into two books; in the first of these I have confined myself to those matters concerning pure analysis. In the second book I have explained those thing which must be known from geometry, since analysis is ordinarily developed in such a way that its application to geometry is shown. In the first book, since all of analysis is concerned with variable quantities and functions of such variables, I have given full treatment to functions. I have also treated the transformation of functions and functions as the sum of infinite series. In addition I have developed functions in infinite series..."

Robertson's Latest Mix of Rich History and Deadly Murder For young Leonhard Euler, the Bernoulli family have been more than just friends. Master Johann has been a demanding

mentor, and his sons have been Leonhard's allies and companions. But it is also a family torn by jealousy and distrust. Father and sons are engaged in a ruthless competition for prestige among the mathematical elites of Europe, especially the greatest prize: the Chair of Mathematics at the University of Basel, which Johann holds and his sons want. And now, their aspirations may have turned deadly. Lured into an investigation of the suspicious death of Uncle Jacob twenty years ago, Leonhard soon realizes there's more at stake than even a prominent appointment. Surrounded by the most brilliant--and cunning--minds of his generation, Leonhard is forced to see how dangerous his world is. His studies in mathematics have always been entwined with his thoughts on theology, and now, caught in a deadly battle of wills, he'll need both his genius and his faith to survive.

Recipient of the Mathematical Association of America's Beckenbach Book Prize in 2008! Leonhard Euler was one of the most prolific mathematicians that have ever lived. This book examines the huge scope of mathematical areas explored and developed by Euler, which includes number theory, combinatorics, geometry, complex variables and many more. The information known to Euler over 300 years ago is discussed, and many of his advances are reconstructed. Readers will be left in no doubt about the brilliance and pervasive influence of Euler's work.

The extraordinary range of cultural interests of renowned physicist David Speiser—including the sciences, art, architecture, music, and history of science—has inspired generations of later scientists to look beyond the boundaries of their own disciplines. In this book, seventeen scholars from various fields pay tribute to his multifaceted career, addressing topics as varied as music theory and the nuclear arms race.

An acclaimed biography of the Enlightenment's greatest mathematician This is the first full-scale biography of Leonhard Euler (1707–1783), one of the greatest mathematicians and theoretical physicists of all time. In this comprehensive and authoritative account, Ronald Calinger connects the story of Euler's eventful life to the astonishing achievements that place him in the company of Archimedes, Newton, and Gauss. Drawing on Euler's massive published works and correspondence, this biography sets Euler's work in its multilayered context—personal, intellectual, institutional, political, cultural, religious, and social. It is a story of nearly incessant accomplishment, from Euler's fundamental contributions to almost every area of pure and applied mathematics in his time—especially calculus, mechanics, and optics—to his advances in shipbuilding, telescopes, acoustics, ballistics, cartography, chronology, and music theory.

"Leonhard Euler and the Bernoullis is a fascinating tale of the Bernoulli family and Euler's association with them. Successful merchants in the 16th and 17th centuries, the Bernoullis were driven out of Antwerp during the persecution of the Huguenots and settled first in Frankfurt, and then in Basel, where one of the most remarkable mathematical dy

His ideas turned the mathematical world on its head. As a scientist he should be placed on the same level as Newton and Einstein. This account of Euler's life and livings is embedded in the great political developments of his time, particularly in Austria, Prussia and Russia. The comic by Elena Pini (illustrations) and Alice and Andreas K. Heyne (text) follows the life of the genius from Basel, who, born 300 years ago, would set out to change the scientific world. The book is completed by a short biography of Euler and relevant data of the most important politicians and contemporaries.

Daniel Bernoulli's Hydrodynamica, published in 1738, marks the first appearance of many topics central to modern science, from the kinetic theory of gases to the principles of jet propulsion. John Bernoulli's Hydraulica, published in 1743, supplements his son's book and deals primary with hydraulics. 104 illustrations.

Euler is one of the greatest and most prolific mathematicians of all time. He wrote the first accessible books on calculus, created the theory of circular functions, and discovered new areas of research such as elliptic integrals, the calculus of variations, graph theory, divergent series, and so on. It took hundreds of years for his successors to develop in full the theories he began, and some of his themes are still at the center of today's mathematics. It is of great interest therefore to examine his work and its relation to current mathematics. This book attempts to do that. In number theory the discoveries he made empirically would require for their eventual understanding such sophisticated developments as the reciprocity laws and class field theory. His pioneering work on elliptic integrals is the precursor of the modern theory of abelian functions and abelian integrals. His evaluation of zeta and multizeta values is not only a fantastic and exciting story but very relevant to us, because they are at the confluence of much research in algebraic geometry and number theory today (Chapters 2 and 3 of the book). Anticipating his successors by more than a century, Euler created a theory of summation of series that do not converge in the traditional manner. Chapter 5 of the book treats the progression of ideas regarding divergent series from Euler to many parts of modern analysis and quantum physics. The last chapter contains a brief treatment of Euler products. Euler discovered the product formula over the primes for the zeta function as well as for a small number of what are now called Dirichlet L-functions. Here the book goes into the

development of the theory of such Euler products and the role they play in number theory, thus offering the reader a glimpse of current developments (the Langlands program).

Sandifer has been studying Euler for decades and is one of the world's leading experts on his work. This volume is the second collection of Sandifer's "How Euler Did It" columns. Each is a jewel of historical and mathematical exposition. The sum total of years of work and study of the most prolific mathematician of history, this volume will leave you marveling at Euler's clever inventiveness and Sandifer's wonderful ability to explicate and put it all in context.

A Text book on Maths

The subject of the book is the development of physics in the 18th century centered upon the fundamental contributions of Leonhard Euler to physics and mathematics. This is the first book devoted to Euler as a physicist. Classical mechanics are reconstructed in terms of the program initiated by Euler in 1736 and its completion over the following decades until 1760. The book examines how Euler coordinated his progress in mathematics with his progress in physics.

The Early Mathematics of Leonhard Euler gives an article-by-article description of Leonhard Euler's early mathematical works; the 50 or so mathematical articles he wrote before he left St. Petersburg in 1741 to join the Academy of Frederick the Great in Berlin. These early pieces contain some of Euler's greatest work, the Konigsberg bridge problem, his solution to the Basel problem, and his first proof of the Euler-Fermat theorem. It also presents important results that we seldom realize are due to Euler; that mixed partial derivatives are (usually) equal, our f(x) f(x) notation, and the integrating factor in differential equations. The books shows how contributions in diverse fields are related, how number theory relates to series, which, in turn, relate to elliptic integrals and then to differential equations. There are dozens of such strands in

this beautiful web of mathematics. At the same time, we see Euler grow in power and sophistication, from a young student when at 18 he published his first work on differential equations (a paper with a serious flaw) to the most celebrated mathematician and scientist of his time. It is a portrait of the world's most exciting mathematics between 1725 and 1741, rich in technical detail, woven with connections within Euler's work and with the work of other mathematicians in other times and places, laced with historical context.

""This is a facsimile reprint of John Hewlett's 1840 translation of Euler's Algebra and Lagrange's Additions thereto. Most of Euler's contribution is elementary, nothing more advanced than solving quartic equations, but worth having in order to appreciate his leisurely and effective style--would that more great mathematicians wrote so well and to such pedagogic effect. However, one third of the book is his lucid treatment of questions in number theory, and it is this material that drew Lagrange's comments. Here for the first time are the rigorous treatments of continued fractions and ""Pell's.

Leonhard Euler's Letters to a German Princess: A Milestone in the History of Physics Textbooks and More is a milestone in the history of physics textbooks and the instruction of women in the sciences. It also covers views of its author on epistemology, religion, and innovations in scientific equipment, including telescopes and microscopes. Today, 250 years later, we study this work of Euler's as a foundation for the history of physics teaching and analyze the letters from an historical and pedagogical point of view.

Leonhard Euler was one of the most prolific mathematicians that have ever lived. This book examines the huge scope of mathematical areas explored and developed by Euler, which includes number theory, combinatorics, geometry, complex variables and many more. The

information known to Euler over 300 years ago is discussed, and many of his advances are reconstructed. Readers will be left in no doubt about the brilliance and pervasive influence of Euler's work.

The Finnish mathematician and astronomer Anders Johan Lexell (1740–1784) was a long-time close collaborator as well as the academic successor of Leonhard Euler at the Imperial Academy of Sciences in Saint Petersburg. Lexell was initially invited by Euler from his native town of Abo (Turku) in Finland to Saint Petersburg to assist in the mathematical processing of the astronomical data of the forthcoming transit of Venus of 1769. A few years later he became an ordinary member of the Academy. This is the first-ever full-length biography devoted to Lexell and his prolific scientific output. His rich correspondence especially from his grand tour to Germany, France and England reveals him as a lucid observer of the intellectual landscape of enlightened Europe. In the skies, a comet, a minor planet and a crater on the Moon named after Lexell also perpetuate his memory.

This book provides the first fully-fledged history of hydrodynamics, including lively accounts of the concrete problems of hydraulics, navigation, blood circulation, meteorology, and aeronautics that motivated the main conceptual innovations. Richly illustrated, technically competent, and philosophically sensitive, it should attract a broad audience and become a standard reference for any one interested in fluid mechanics.

This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our

most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work. As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

The Kenneth May Lectures have never before been published in book form Important contributions to the history of mathematics by well-known historians of science Should appeal to a wide audience due to its subject area and accessibility

This book primarily serves as a historical research monograph on the biographical sketch and career of Leonhard Euler and his major contributions to numerous areas in the mathematical and physical sciences. It contains fourteen chapters describing Euler''s works on number theory, algebra, geometry, trigonometry, differential and integral calculus, analysis, infinite series and infinite products, ordinary and elliptic integrals and special functions, ordinary and partial differential equations, calculus of variations, graph theory and topology, mechanics and ballistic research, elasticity and fluid mechanics, physics and astronomy, probability and statistics. The book is written to provide a definitive impression of Euler''s personal and professional life as well as of the range, power, and depth of his unique contributions. This tricentennial tribute commemorates Euler the great man and Euler the universal mathematician of all time. Based on the author''s historically motivated method of teaching, special attention is

given to demonstrate that Euler''s work had served as the basis of research and developments of mathematical and physical sciences for the last 300 years. An attempt is also made to examine his research and its relation to current mathematics and science. Based on a series of Euler''s extraordinary contributions, the historical development of many different subjects of mathematical sciences is traced with a linking commentary so that it puts the reader at the forefront of current research. Erratum. Sample Chapter(s). Chapter 1: Mathematics Before Leonhard Euler (434 KB). Contents: Mathematics Before Leonhard Euler; Brief Biographical Sketch and Career of Leonhard Euler; Euler''s Contributions to Number Theory and Algebra; Euler''s Contributions to Geometry and Spherical Trigonometry; Euler''s Formula for Polyhedra, Topology and Graph Theory; Euler''s Contributions to Calculus and Analysis; Euler''s Contributions to the Infinite Series and the Zeta Function; Euler''s Beta and Gamma Functions and Infinite Products; Euler and Differential Equations; The Euler Equations of Motion in Fluid Mechanics; Euler''s Contributions to Mechanics and Elasticity; Euler''s Work on the Probability Theory; Euler''s Contributions to Ballistics; Euler and His Work on Astronomy and Physics. Readership: Undergraduate and graduate students of mathematics, mathematics education, physics, engineering and science. As well as professionals and prospective mathematical scientists.

1 We search the concepts and methods) of the theory of deformable sonds from GALILEO to LAGRANGE. Neither of them achieved much in our subject, but their works serve as 2 termini: With GALILEO's Discorsi in 1638 our matter begins) (for this is the history of mathematical theory), while LAGRANGE's Mechanique Analitique closed the mechanics of 1) There are three major historical works that bear on our subject. The first is A history of the theory of

elasticity and of the strength of materials by I. ToDHUNTER, "edited and completed" by K. PEARSON, Vol. I, Cambridge, 1886. Unfortunately it is necessary to give warning that this book fails to meet the standard set by the histories ToDHUNTER lived to finish. Much of what ToDHUNTER left seems to be rather the rough notes for a book than the book itself; the parts due to PEARSON are fortunately distinguished by square brackets. Researches prior to 1800 are disposed of in the first chapter, 79 pages long and almost entirely the work of PEARSON; as frontispiece to a work whose title restricts it to theory he saw fit to supply a possibly original pen drawing entitled "Rupture. Sur faces of Cast-Iron".