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Geochronology and Thermochronology by the 40Ar/39Ar Method Development and Application of 40Ar/39Ar Laser-fusion Dating and 40Ar/39Ar Step-heating Dating of Quaternary Basaltic Volcanic Rocks **Argon Geochronology** 40Ar/39Ar Dating and Its Application to the Calibration of the North American Land Mammal Ages Advances in 40Ar/39Ar Dating **Encyclopedia of Geoarchaeology K-Ar and 40Ar/39Ar Geochronology, Geochemistry, and Structural Reinterpretation of the Southern Sonoma Volcanic Field, Sonoma County, California Effects of Shock Pressure on 40Ar-39Ar Radiometric Age Determinations** *Understanding 40Ar/39Ar Age Variations in Basaltic Lavas* **Forty Ar, Thirty Nine Ar Age Spectrum Data for Whole Rock Samples of the Martinsburg Formation, Lehigh Gap Area, Pennsylvania** *40Ar/39Ar Age Calibration of the 100,000 Year Middle Pleistocene Climate Cycle U.S. Geological Survey Professional Paper Geochronology and Thermochronology* **Irradiation of Samples for 40Ar/39Ar Dating Using the Soreq Nuclear Research Center IRR-1 Reactor** Principles and Practice of Analytical Techniques in Geosciences **Encyclopedia of Geology** Nuclear Methods in Mineralogy and Geology Understanding Faults *Distal Impact Ejecta Layers* Geologic Time Scale 2020 *Paleoseismic Investigation and Long-term Slip History of the Hurricane Fault in Southwestern Utah* Geochronology and Thermochronology

Late Cretaceous and Cenozoic Mammals of North America *40Ar/39Ar Dating of Late Pleistocene Marine and Terrestrial Tephra from the Tyrrhenian and Ionian Seas, Mediterranea* **Radiogenic Isotope Geology The Late Eocene Earth Hadean Earth** *Open-file Report Petrochronology* Feldspars and their Reactions *Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile* **Geochemistry** Radioactive and Stable Isotope Geology **Plates, Plumes, and Planetary Processes** The Phanerozoic Thermo-tectonic Evolution of Northern Mozambique Constrained by 40Ar-39Ar, Fission Track and (U-Th)-He Analyses **Peninsular Ranges Batholith, Baja and Southern California** Paleoclimatology *Principles of Igneous and Metamorphic Petrology* **Paleoclimatology Encyclopedia of Dinosaurs**

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Geochronology and Thermochronology Oct 16 2021 This book is a welcome introduction and reference for users and innovators in geochronology. It provides modern perspectives on the current state-of-the art in most of the principal areas of geochronology and thermochronology, while recognizing that they are changing at a fast pace. It emphasizes fundamentals and systematics, historical perspective, analytical methods, data interpretation, and some applications chosen from the literature. This book complements existing coverage by expanding on those parts of isotope geochemistry that are concerned with dates and rates and insights into Earth and planetary science that come from temporal perspectives. Geochronology and Thermochronology offers chapters covering: Foundations of Radioisotopic Dating; Analytical Methods; Interpretational Approaches: Making Sense of Data; Diffusion and Thermochronologic Interpretations; Rb-Sr, Sm-Nd, Lu-Hf; Re-Os and Pt-Os; U-Th-Pb Geochronology and Thermochronology; The K-Ar and 40Ar/39Ar Systems; Radiation-damage Methods of Geo- and Thermochronology; The (U-Th)/He System; Uranium-series Geochronology; Cosmogenic Nuclides; and Extinct Radionuclide Chronology. Offers a foundation for understanding each of the methods and for illuminating directions that will be important in the near future Presents the fundamentals, perspectives, and opportunities in modern geochronology in a way that inspires further innovation, creative technique development, and applications Provides references to rapidly evolving topics that will enable readers to pursue future developments Geochronology and Thermochronology is designed for graduate and upper-level undergraduate students with a solid background in mathematics, geochemistry, and geology.

Read an interview with the editors to find out more: https://eos.org/editors-vox/the-science-of-dates-and-rates

Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and Northern Chile Mar 29 2020 "This memoir brings together results from a multidisciplinary study of the processes that have formed the highest, widest part of the Andean Cordilleran orogenic belt in northern Argentina and Chile. The region features a tectonically erosive forearc, protracted arc magmatism, a high-elevation hinterland plateau and strongly shortened retroarc thrust belt, and a Paleocene-Recent foreland basin system"--

40Ar/39Ar Dating of Late Pleistocene Marine and Terrestrial Tephra from the Tyrrhenian and Ionian Seas, Mediterranea Nov 05 2020 Ce doctorat a permis l'établissement de nouveaux âges 40Ar/39Ar sur des échantillons très jeunes. Le premier chapitre est publié dans "Earth and planetary science letters". Un âge a été obtenu sur un tephra très jeune, provenant des champs phlégréens. Il permet une calibration d'autres événements climatiques et géologiques tels qu'un pic de 10Be (identifié dans des carottes de glace, des océans atlantique, pacifique et méditerranée), une excursion magnétique nommée Laschamp (marqueur global), une calibration des âges 14C>35 ka. Les autres données provenant de l'île de Pantelleria et de tephra marins (mer Ionienne), permettent de comparer des échantillons terrestres et marins. La datation simultanée est un outil puissant pour déterminer la source d'un échantillon marin dont l'origine est incertaine. Une fois la source définie, on peut ensuite facilement travailler sur les échantillons terrestres, disponibles en plus grande quantité et dont les cristaux sont plus grands (datation de monocristaux).

Principles and Practice of Analytical Techniques in Geosciences Aug 14 2021 This

book presents a comprehensive overview of the latest developments in chemical detection science in the field of Geoscience, written for both postgraduates and professional researchers.

Hadean Earth Aug 02 2020 This book consolidates the latest research on the Hadean Eon - the first 500 million years of Earth history - which has permitted hypotheses of early Earth evolution to be tested, including geophysical models that include the possibility of plate tectonic-like behavior. These new observations challenge the longstanding Hadean paradigm – based on no observational evidence - of a desiccated, lifeless, continent-free wasteland in which surface petrogenesis was largely due to extraterrestrial impacts. The eon was termed "Hadean" to reflect such a hellish environment. That view began to be challenged in 2001 as results of geochemical analyses of greater than 4 billion year old zircons from Australia emerged. These data were consistent with the zircons forming in a world much more similar to today than long thought and interpreted to indicate that sediment cycling was occurring in the presence of liquid water. This new view leaves open the possibility that life could have emerged shortly after Earth accretion. The epistemic limitations under which the old paradigm persisted are closely examined. The book is principally designed as a monograph but has the potential to be used as a text for advanced graduate courses on early Earth evolution.

Feldspars and their Reactions Apr 29 2020 Feldspar minerals make up 60% of the crust of the Earth. They are stable in the upper mantle, and are so abundant in the crust that they form the basis of the classification of igneous rocks. At the surface, feldspars weather to form clay minerals which are the most important mineral constituent of soils. The articles in this book review the chemical reactions of feldspars over the whole sweep of pressure and temperature

regimes in the outer Earth, and describe the fundamental aspects of crystal structure which underlie their properties. The book covers intracrystalline reactions, such as order-disorder transformations and exsolution, and transfer of stable and radiogenic isotopes, which can be interpreted to provide insights into the thermal history of rocks. It is suitable for final year undergraduates or research workers.

Plates, Plumes, and Planetary Processes Dec 26 2019 Presents a collection of papers discussing various hypotheses and models of planetary plumes.

Encyclopedia of Geology Jul 13 2021 Encyclopedia of Geology, Second Edition presents in six volumes state-of-the-art reviews on the various aspects of geologic research, all of which have moved on considerably since the writing of the first edition. New areas of discussion include extinctions, origins of life, plate tectonics and its influence on faunal provinces, new types of mineral and hydrocarbon deposits, new methods of dating rocks, and geological processes. Users will find this to be a fundamental resource for teachers and students of geology, as well as researchers and non-geology professionals seeking up-to-date reviews of geologic research. Provides a comprehensive and accessible one-stop shop for information on the subject of geology, explaining methodologies and technical jargon used in the field Highlights connections between geology and other physical and biological sciences, tackling research problems that span multiple fields Fills a critical gap of information in a field that has seen significant progress in past years Presents an ideal reference for a wide range of scientists in earth and environmental areas of study

Paleoclimatology Jul 21 2019 Paleoclimatology: Reconstructing Climates of the Quaternary, Third Edition—winner of a 2015 Textbook Excellence Award

(Texty) from The Text and Academic Authors Association—provides a thorough overview of the methods of paleoclimatic reconstruction and of the historical changes in climate during the past three million years. This thoroughly updated and revised edition systematically examines each type of proxy and elucidates the major attributes and the limitations of each. Paleoclimatology, Third Edition provides necessary context for those interested in understanding climate changes at present and how current trends in climate compare with changes that have occurred in the past. The text is richly illustrated and includes an extensive bibliography for further research. Winner of a 2015 Texty Award from the Text and Academic Authors Association A comprehensive overview of the methods of paleoclimate reconstruction, and the record of past changes in climate during the last ~3 million years Addresses all the techniques used in paleoclimatic reconstruction from climate proxies With full-color throughout, and thoroughly revised chapters on dating methods, climate forcing, ice cores, marine sediments, pollen analysis, dendroclimatology, and historical records Includes new chapters on speleothems, loess, and lake sediments More than 1,000 new references and 190 new figures Essential reading for those interested in how present trends in climate compare with changes that have occurred in the past

Development and Application of 40Ar/39Ar Laser-fusion Dating and 40Ar/39Ar Step-heating Dating of Quaternary Basaltic Volcanic Rocks Sep 27 2022

Encyclopedia of Dinosaurs Jun 19 2019 This book is the most authoritative encyclopedia ever prepared on dinosaurs and dinosaur science. In addition to entries on specific animals such as Tyrannosaurus, Triceratops, and Velociraptor, the Encyclopedia of Dinosaurs covers reproduction, behavior,

physiology, and extinction. The book is generously illustrated with many detailed drawings and photographs, and includes color pictures and illustrations that feature interpretations of the best known and most important animals. All alphabetical entries are cross-referenced internally, as well as at the end of each entry. The Encyclopedia includes up-to-date references that encourage the reader to investigate personal interests. The most authoritative encyclopedia ever prepared on dinosaurs Includes many detailed drawings, photographs and illustrations in both color and black-and-white Contains comprehensively cross-referenced alphabetical entries with internal references, as well as references at the conclusion of each entry Provides in-depth references, allowing readers to pursue independent interests Includes sixteen plates and 35 color illustrations

Peninsular Ranges Batholith, Baja and Southern California Oct 24 2019 "This book includes petrology, geochronology, and regional aspects of individual plutons, as well as evolution of the Peninsular Ranges batholith. Several chapters deal with geophysical, chemical, and isotopic based interpretations of the genesis and evolution of the batholith. An accompanying DVD contains detailed colored maps and chemical, isotopic, mineralogic, and physical properties data"--Provided by publisher.

Paleoseismic Investigation and Long-term Slip History of the Hurricane Fault in Southwestern Utah Feb 08 2021 This 81 page report presents the results of a study of the Hurricane fault in Utah.

Irradiation of Samples for 40Ar/39Ar Dating Using the Soreq Nuclear Research Center IRR-1 Reactor Sep 15 2021

Geologic Time Scale 2020 Mar 09 2021 Geologic Time Scale 2020 (2 volume set) contains contributions from 80+ leading scientists who present syntheses in an easy-to-

understand format that includes numerous color charts, maps and photographs. In addition to detailed overviews of chronostratigraphy, evolution, geochemistry, sequence stratigraphy and planetary geology, the GTS2020 volumes have separate chapters on each geologic period with compilations of the history of divisions, the current GSSPs (global boundary stratotypes), detailed bio-geochem-sequence correlation charts, and derivation of the age models. The authors are on the forefront of chronostratigraphic research and initiatives surrounding the creation of an international geologic time scale. The included charts display the most up-to-date, international standard as ratified by the International Commission on Stratigraphy and the International Union of Geological Sciences. As the framework for deciphering the history of our planet Earth, this book is essential for practicing Earth Scientists and academics. • Completely updated geologic time scale • Provides the most detailed integrated geologic time scale available that compiles and synthesize information in one reference • Gives insights on the construction, strengths and limitations of the geological time scale that greatly enhances its function and its utility

Principles of Igneous and Metamorphic Petrology Aug 22 2019 This textbook provides a basic understanding of the formative processes of igneous and metamorphic rock through quantitative applications of simple physical and chemical principles. The book encourages a deeper comprehension of the subject by explaining the petrologic principles rather than simply presenting the student with petrologic facts and terminology. Assuming knowledge of only introductory college-level courses in physics, chemistry, and calculus, it lucidly outlines mathematical derivations fully and at an elementary level, and

is ideal for intermediate and advanced courses in igneous and metamorphic petrology. The end-of-chapter quantitative problem sets facilitate student learning by working through simple applications. They also introduce several widely-used thermodynamic software programs for calculating igneous and metamorphic phase equilibria and image analysis software. With over 350 illustrations, this revised edition contains valuable new material on the structure of the Earth's mantle and core, the properties and behaviour of magmas, recent results from satellite imaging, and more.

Late Cretaceous and Cenozoic Mammals of North America Dec 06 2020 This book places into modern context the information by which North American mammalian paleontologists recognize, divide, calibrate, and discuss intervals of mammalian evolution known as North American Land Mammal Ages. It incorporates new information on the systematic biology of the fossil record and utilizes the many recent advances in geochronologic methods and their results. The book describes the increasingly highly resolved stratigraphy into which all available temporally significant data and applications are integrated. Extensive temporal coverage includes the Lancian part of the Late Cretaceous, and geographical coverage includes information from Mexico, an integral part of the North American fauna, past and present.

Understanding Faults May 11 2021 Understanding Faults: Detecting, Dating, and Modeling offers a single resource for analyzing faults for a variety of applications, from hazard detection and earthquake processes, to geophysical exploration. The book presents the latest research, including fault dating using new mineral growth, fault reactivation, and fault modeling, and also helps bridge the gap between geologists and geophysicists working across fault-related disciplines. Using diagrams,

formulae, and worldwide case studies to illustrate concepts, the book provides geoscientists and industry experts in oil and gas with a valuable reference for detecting, modeling, analyzing and dating faults. Presents cutting-edge information relating to fault analysis, including mechanical, geometrical and numerical models, theory and methodologies Includes calculations of fault sealing capabilities Describes how faults are detected, what fault models predict, and techniques for dating fault movement Utilizes worldwide case studies throughout the book to concretely illustrate key concepts

Effects of Shock Pressure on 40Ar-39Ar Radiometric Age Determinations Mar 21 2022

Argon Geochronology Aug 26 2022

Advances in 40Ar/39Ar Dating Jun 24 2022 Decoding the complete history of Earth and our solar system requires the placing of the scattered pages of Earth history in a precise chronological order, and the 40Ar/39Ar dating technique is one of the most trusted dating techniques to do that. The 40Ar/39Ar method has been in use for more than 40 years, and has constantly evolved since then. The steady improvement of the technique is largely due to a better understanding of the K/Ar system, an appreciation of the subtleties of geological material and a continuous refinement of the analytical tools used for isotope extraction and counting. The 40Ar/39Ar method is also one of the most versatile techniques with countless applications in archaeology, tectonics, structural geology, orogenic processes and provenance studies, ore and petroleum genesis, volcanology, weathering processes and climate, and planetary geology. This volume is the first of its kind and covers methodological developments, modelling, data handling, and direct applications of the 40Ar/39Ar technique.

U.S. Geological Survey

Professional Paper Nov 17 2021

Petrochronology May 31 2020 Petrochronology is a rapidly emerging branch of Earth science that links time (ages or rates) with specific rock-forming processes and their physical conditions. It is founded in petrology and geochemistry, which define a petrogenetic context or delimit a specific process, to which chronometric data are then linked. This combination informs Earth's petrogenetic processes better than petrology or geochronology alone. This volume and the accompanying short courses address three broad categories of inquiry. Conceptual approaches chapters include petrologic modeling of multi-component chemical and mineralogic systems, and development of methods that include diffusive alteration of mineral chemistry. Methods chapters address four main analytical techniques, specifically EPMA, LA-ICP-MS, SIMS and TIMS. Mineral-specific chapters explore applications to a wide range of minerals, including zircon (metamorphic, igneous, and detrital/Hadean), baddeleyite, REE minerals (monazite, allanite, xenotime and apatite), titanite, rutile, garnet, and major igneous minerals (olivine, plagioclase and pyroxenes). These applications mainly focus on metamorphic, igneous, or tectonic processes, but additionally elucidate fundamental transdisciplinary progress in addressing mechanisms of crystal growth, the chemical consequences of mineral growth kinetics, and how chemical transport and deformation affect chemically complex mineral composites. Most chapters further recommend areas of future research.

Encyclopedia of Geoarchaeology May 23 2022 Geoarchaeology is the archaeological subfield that focuses on archaeological information retrieval and problem solving utilizing the methods of geological investigation. Archaeological recovery and analysis are

already geoarchaeological in the most fundamental sense because buried remains are contained within and removed from an essentially geological context. Yet geoarchaeological research goes beyond this simple relationship and attempts to build collaborative links between specialists in archaeology and the earth sciences to produce new knowledge about past human behavior using the technical information and methods of the geosciences. The principal goals of geoarchaeology lie in understanding the relationships between humans and their environment. These goals include (1) how cultures adjust to their ecosystem through time, (2) what earth science factors were related to the evolutionary emergence of humankind, and (3) which methodological tools involving analysis of sediments and landforms, documentation and explanation of change in buried materials, and measurement of time will allow access to new aspects of the past. This encyclopedia defines terms, introduces problems, describes techniques, and discusses theory and strategy, all in a format designed to make specialized details accessible to the public as well as practitioners. It covers subjects in environmental archaeology, dating, materials analysis, and paleoecology, all of which represent different sources of specialist knowledge that must be shared in order to reconstruct, analyze, and explain the record of the human past. It will not specifically cover sites, civilizations, and ancient cultures, etc., that are better described in other encyclopedias of world archaeology. The Editor Allan S. Gilbert is Professor of Anthropology at Fordham University in the Bronx, New York. He holds a B.A. from Rutgers University, and his M.A., M.Phil., and Ph.D. were earned at Columbia University. His areas of research interest include the Near East (late prehistory and early historic periods) as well as the Middle Atlantic region of the U.S.

(historical archaeology). His specializations are in archaeozoology of the Near East and geoarchaeology, especially mineralogy and compositional analysis of pottery and building materials. Publications have covered a range of subjects, including ancient pastoralism, faunal quantification, skeletal microanatomy, brick geochemistry, and two co-edited volumes on the marine geology and geoarchaeology of the Black Sea basin.

40Ar/39Ar Age Calibration of the 100,000 Year Middle Pleistocene Climate Cycle Dec 18 2021

Radioactive and Stable Isotope Geology Jan 27 2020 Accelerating progress in the application of radioactive and stable isotope analysis to a varied range of geologicla and geochemical problems in geology has required a complete revision of Isotopes in the Earth Sciences, published in 1988. This new book comprises four parts: the first introduces isotopic chemistry and examines mass spectroscopic methods; the second eeals with radiometric dating methods. Part Three examines the importance of isotopes in climato-environmental studies, and increasingly significant area of research. The last part looks at extra-terrestrial matter, geothermometry and the isotopic geochemistry of the Earth's lithosphere. Post-graduate and post-doctoral researchers in geochemistry, as well as final year undergraduates in the earth and environmental sciences, will find Radioactive and Stable Isotope Geology an invaluable, uo-to-date and thorough treatment of the theory and practice of isotopie geology.

Geochronology and Thermochronology by the 40Ar/39Ar Method Oct 28 2022 Argon isotopic dating is one of the most important techniques for estimating the ages of rocks and can be used on very small samples. It has been used to assign reliable ages to the Earth and numerous meteorites. This second edition covers the standard principles

and methods and incorporates many of new developments from the last decade. It covers the basis of the method, technical aspects, data presentation, diffusion theory, thermochronology, and many applications and case studies.

Forty Ar, Thirty Nine Ar Age Spectrum Data for Whole Rock Samples of the Martinsburg Formation, Lehigh Gap Area, Pennsylvania Jan 19 2022

Open-file Report Jul 01 2020

Radiogenic Isotope Geology Oct 04 2020 The new edition of Radiogenic Isotope Geology examines revolutionary changes in geochemical thinking, evaluating them in historical context.

Geochronology and Thermochronology Jan 07 2021 This book is a welcome introduction and reference for users and innovators in geochronology. It provides modern perspectives on the current state-of-the art in most of the principal areas of geochronology and thermochronology, while recognizing that they are changing at a fast pace. It emphasizes fundamentals and systematics, historical perspective, analytical methods, data interpretation, and some applications chosen from the literature. This book complements existing coverage by expanding on those parts of isotope geochemistry that are concerned with dates and rates and insights into Earth and planetary science that come from temporal perspectives. Geochronology and Thermochronology offers chapters covering: Foundations of Radioisotopic Dating; Analytical Methods; Interpretational Approaches: Making Sense of Data; Diffusion and Thermochronologic Interpretations; Rb-Sr, Sm-Nd, Lu-Hf; Re-Os and Pt-Os; U-Th-Pb Geochronology and Thermochronology; The K-Ar and 40Ar/39Ar Systems; Radiation-damage Methods of Geo- and Thermochronology; The (U-Th)/He System; Uranium-series Geochronology; Cosmogenic Nuclides; and Extinct Radionuclide

Chronology. Offers a foundation for understanding each of the methods and for illuminating directions that will be important in the near future Presents the fundamentals, perspectives, and opportunities in modern geochronology in a way that inspires further innovation, creative technique development, and applications Provides references to rapidly evolving topics that will enable readers to pursue future developments Geochronology and Thermochronology is designed for graduate and upper-level undergraduate students with a solid background in mathematics, geochemistry, and geology. Read an interview with the editors to find out more: https://eos.org/editors-vox/the-science-of-dates-and-rates

The Phanerozoic Thermo-tectonic Evolution of Northern Mozambique Constrained by 40Ar-39Ar, Fission Track and (U-Th)-He Analyses Nov 24 2019

The Late Eocene Earth Sep 03 2020 The Late Eocene and the Eocene-Oligocene (E-O) transition mark the most profound oceanographic and climatic changes of the past 50 million years of Earth history, with cooling beginning in the middle Eocene and culminating in the major earliest Oligocene Oi-1 isotopic event. The Late Eocene is characterized by an accelerated global cooling, with a sharp temperature drop near the E-O boundary, and significant stepwise floral and faunal turnovers. These global climate changes are commonly attributed to the expansion of the Antarctic ice cap following its gradual isolation from other continental masses. However, multiple extraterrestrial bolide impacts, possibly related to a comet shower that lasted more than 2 million years, may have played an important role in deteriorating the global climate at that time. This book provides an up-to-date review of what happened on Earth at the end of the Eocene Epoch.

Geochemistry Feb 26 2020 A Comprehensive Introduction to the “Geochemist Toolbox” – the Basic Principles of Modern Geochemistry In the new

edition of William M. White's Geochemistry, undergraduate and graduate students will find each of the core principles of geochemistry covered. From defining key principles and methods to examining Earth's core composition and exploring organic chemistry and fossil fuels, this definitive edition encompasses all the information needed for a solid foundation in the earth sciences for beginners and beyond. For researchers and applied scientists, this book will act as a useful reference on fundamental theories of geochemistry, applications, and environmental sciences. The new edition includes new chapters on the geochemistry of the Earth's surface (the "critical zone"), marine geochemistry, and applied geochemistry as it relates to environmental applications and geochemical exploration. ● A review of the fundamentals of geochemical thermodynamics and kinetics, trace element and organic geochemistry ● An introduction to radiogenic and stable isotope geochemistry and applications such as geologic time, ancient climates, and diets of prehistoric people ● Formation of the Earth and composition and origins of the core, the mantle, and the crust ● New chapters that cover soils and streams, the oceans, and geochemistry applied to the environment and mineral exploration In this foundational look at geochemistry, new learners and professionals will find the answer to the essential principles and techniques of the science behind the Earth and its environs.

K-Ar and 40Ar/39Ar Geochronology, Geochemistry, and Structural Reinterpretation of the Southern Sonoma Volcanic Field, Sonoma County, California Apr 22 2022

Nuclear Methods in Mineralogy and Geology Jun 12 2021 This book appears a century after the discovery of radioactivity. It was in 1896, when Henri Becquerel reported his first results about the penetrating radiation, which could darken the packed photographic

plates. The initial fascination of radioactivity, e.g., the discovery of new radioactive elements, the first real description of the structure of atoms and their nuclei, the applications of radiotracers, the high sensitivity of activation analysis, etc., was followed by the use of atomic bomb in 1945. The mushroom cloud became a symbol of destructive nuclear power. And even nuclear energy production (which provides about 20% of the world's electricity) is overshadowed by radioactive waste. However, the latest results suggest that the Accelerator-Driven Transmutation Technology (ADTT) will solve this problem, since this technique can decrease the lifetime of the fission products comparatively to the human lifespan. Practical control of fusion may also be possible in the first decades of the next millennium.

40Ar/39Ar Dating and Its Application to the Calibration of the North American Land Mammal Ages Jul 25 2022

Understanding 40Ar/39Ar Age Variations in Basaltic Lavas Feb 20 2022

Distal Impact Ejecta Layers Apr 10 2021 Impact cratering is an important geological process on all solid planetary bodies, and, in the case of Earth, may have had major climatic and biological effects. Most terrestrial impact craters have been erased or modified beyond recognition. However, major impacts throw ejecta over large areas of the Earth's surface. Recognition of these impact ejecta layers can help fill in the gaps in the terrestrial cratering record and at the same time provide direct correlation between major impacts and other geological events, such as climatic changes and mass extinctions. This book provides the first summary of known distal impact ejecta layers

Paleoclimatology Sep 22 2019 This two-volume book provides a comprehensive, detailed understanding of paleoclimatology beginning by describing the “proxy data” from which quantitative

climate parameters are reconstructed and finally by developing a comprehensive Earth system model able to simulate past climates of the Earth. It compiles contributions from specialists in each field who each have an in-depth knowledge of their particular area of expertise. The first volume is devoted to “Finding, dating and interpreting the evidence”. It describes the different geo-chronological technical methods used in paleoclimatology. Different fields of geosciences such as: stratigraphy, magnetism, dendrochronology, sedimentology, are drawn from and proxy reconstructions from ice sheets, terrestrial (speleothems, lakes, and vegetation) and oceanic data, are used to reconstruct the ancient climates of the Earth. The second volume, entitled “Investigation into ancient climates,” focuses on building comprehensive models of past climate evolution. The chapters are based on understanding the processes driving the evolution of each component of the Earth system (atmosphere, ocean, ice). This volume provides both an analytical understanding of each component using a hierarchy of models (from conceptual to very sophisticated 3D general circulation models) and a synthetic approach incorporating all of these components to explore the evolution of the Earth as a global system. As a whole this book provides the reader with a complete view of data reconstruction and modeling of the climate of the Earth from deep time to present day with even an excursion to include impacts on future climate.