2024 | Volume Volume - 6 - Issue Issue - 1

In this issue

Research Article

An innovative method and a medical screening device for cancer detection in real-time

Author(s): K Papageorgiou* and G Papageorgiou

Histopathology is the main technique to assess the presence of cancer cells in biopsy material and for the evaluation of positive resection margins, but it is not real-time. Older methods to assess resection margin intraoperatively are either time-consuming or exhibit a low accuracy. More recent imaging techniques have various drawbacks, like the need for exogenous co ...

Abstract View   Full Article View

Analyzing Riemann's hypothesis

Author(s): Mercedes Orús–Lacort, Román Orús and Christophe Jouis*

In this paper we perform a detailed analysis of Riemann's hypothesis, dealing with the zeros of the analytically-extended zeta function. We use the functional equation for complex numbers s such that $0 < Re(s) < 1$, and the reduction to the absurd method, where we use an analytical study based on a complex function and its modulus as a real function of two real vari ...

Abstract View   Full Article View

Certain results of Aleph-Function based on natural transform of fractional order

Author(s): Aarti Pathak, Rajshree Mishra, DK Jain, Farooq Ahmad and Altaf Ahmad Bhat*

In this research article, a new type of fractional integral transform namely the N-transform of fractional order is proposed, and derived a number of useful results of a more generalized function (Aleph-function) of fractional calculus by making use of the N-transform of fractional order. Further, the relation between it and other fractional transforms is given and so ...

The link between *s* and *d* components of electron boson coupling constants in one band d wave Eliashberg theory for high T_c superconductors

Author(s): GA Ummarino*

The phenomenology of overdoped high Tc uperconductors can be described by a one band d wave Eliashberg theory where the mechanism of superconducting coupling is mediated by antiferromagnetic spin fluctuations and whose characteristic energy 0 scales with Tc according to the empirical law 0 = 5.8 kBTc. This model presents universal characteristics that are independen ...

Determinism and chaos – a story about Big Bang, singularity and the future of mankind

Author(s): Alexandru Dinu* and Madalin Frunzete

People have always tried to understand and tame the nature around them. It is a well-known fact that the sanest and safe approach from a psychological point of view is to focus on the present moment, the here and now. Nevertheless, we keep looking and living in the past or daydreaming and making predictions about what the future will bring. This paper is looking at th ...

On -fractional variational calculus

Published On: March 01, 2023 | Pages: 036 - 040

Author(s): KA Lazopoulos and AK Lazopoulos*

Pointing out that -fractional analysis is the unique fractional calculus theory including mathematically acceptable fractional derivatives, variational calculus for -fractional analysis is established. Since -fractional analysis is a non-local procedure, global extremals are only accepted. That means the extremals should satisfy not only the Euler–Lagrange equation ...

Abstract View   Full Article View   DOI: 10.17352/amp.000074

Experimental and theoretical studies of the influence of the bench elements on the transient operation of the turbine

Published On: February 22, 2023 | Pages: 029 - 035

Author(s): AF Salnikov, SV Bochkarev and IA Zubko*

The energy parameters obtained during the tests of turbines of power units on the stand differ from those in the product. The research data, which results are presented in the materials of the paper, are aimed at analyzing the discrepancies between the parametric indicators of power units and bench tests of the turbines. The novelty of the obtained results reveals the ...

Abstract View   Full Article View   DOI: 10.17352/amp.000073

Spectral analysis of the Sturm-Liouville operator given on a system of segments

Published On: February 07, 2023 | Pages: 012 - 020

Author(s): Snizhana Vovchuk*

The spectral analysis of the Sturm-Liouville operator defined on a finite segment is the subject of an extensive literature [1,2]. Sturm-Liouville operators on a finite segment are well studied and have numerous applications [1-6]. The study of such operators already given on the system segments (graphs) was received in the works [7,8]. This work is devoted to the stu ...

Abstract View   Full Article View   DOI: 10.17352/amp.000070

Two methods for determining combinatorial identities

Published On: January 10, 2023 | Pages: 007 - 011

Author(s): Victor Kowalenko*

Two methods are presented for determining advanced combinatorial identities. The first is based on extending the original identity so that it can be expressed in terms of hypergeometric functions whereupon tabulated values of the functions can be used to reduce the identity to a simpler form. The second is a computer method based on Koepf's version of the Wilf-Zeilber ...

Abstract View   Full Article View   DOI: 10.17352/amp.000069

Review Article

Comparison of the performances between the gray and non-gray media approaches of thermal transport in silicon-tin

Published On: June 17, 2023 | Pages: 089 - 092

Author(s): C Iheduru*, MA Eleruja, B Olofinjana, OE Awe and ADA Buba

We have compared the performances of the gray and non–gray media approaches of thermal transport in Silicon – Tin using Monte Carlo Simulation. The Boltzmann Transport Equation (BTE) for phonons was used to describe the heat flow and ballistic conduction in semiconducting alloy systems. In this work, we have attempted solving the BTE using Monte Carlo (MC) simulation ...

Abstract View   Full Article View   DOI: 10.17352/amp.000085

Qu Vdis theoretical physics and cosmology? from Newton's Metaphysics to Einstein's Theology

Published On: June 02, 2023 | Pages: 065 - 070

Author(s): Abdul Malek*

The crisis in modern theoretical physics and cosmology has its root in its use, along with theology as a ruling-class tool,

since medieval Europe. The Copernican revolution overthrowing the geocentric cosmology of theology led to unprecedented social and scientific developments in history. But Isaac Newton's mathematical idealism-based and on-sided theory of universal ...

Short Communication

Fractal space-time and variations of the hubble constant

Author(s): Irina Rozgacheva*

Spatial variations of the Hubble constant are considered according to Riess, et al. (2018). It is noted that the values of the Hubble constant form an almost fractal manifold. This fact suggests that the variations may be associated with local gravitational perturbations in the neighborhoods of galaxies, in which there are Cepheids and supernovae selected for measurem ...

Calculation of the magnetic field of the asteroid 4 Vesta parent body (Application of SK theory)

Author(s): Violeta N Nikoli*

The SK theory provides a deeper insight into the magnetic properties of celestial bodies. In this study, the magnetic field calculated of the parent body of asteroid 4 Vesta, could facilitate deeper insight into the formation of planets or the Universe. ...

About the connection of the electron binding energy of a single carbon anion with binding energies of an electron attached to carbon molecules

Published On: January 09, 2023 | Pages: 004 - 006

Author(s): AS Baltenkov and I Woiciechowski*

We demonstrate that the model of zero-range potentials can be successfully employed for the description of attached electrons in atomic and molecular anions, for example, negatively charged carbon clusters. To illustrate the capability of the model we calculate the energies of the attached electron for the family of carbon cluster anions consisting of two-, three- (eq ...

Abstract View   Full Article View   DOI: 10.17352/amp.000068

Boundary value problem for the third-order equation with multiple characteristics

Published On: January 06, 2023 | Pages: 001 - 003

Author(s): Djumaniyazova Khilola Atamuratovna and Khashimov Abdukomil Risbekovich*

The article constructs a unique solution to a tertiary-order equation with multiple characteristics with boundary conditions that include all possible local boundary conditions. The uniqueness of the solution of boundary value problems is proved by the method of integral equations using the sign-definiteness of quadratic forms. When proving the existence of a solution ...

Abstract View   Full Article View   DOI: 10.17352/amp.000067

Letter to Editor

The conclusion of the limitless hotel problem

Published On: June 19, 2023 | Pages: 093 - 096

Author(s): Ling Xie*

Mathematician Cantor's Set theory appeared paradox and mathematical theory crisis. The famous German mathematician Hilbert used "Hilbert Hotel" to describe Cantor's Set theory paradox. At that time, people could not find a strict mathematical theory to refute Cantor's Set theory, but let everyone get used to and accept Cantor's Set theory, and

thought that it was not ...

Confirm that the imaginary number i is a closed field

Published On: June 13, 2023 | Pages: 071 - 074

Author(s): Ling Xie*

In the History of mathematics of mankind, some strange symbols appeared when dealing with some mathematical problems, which were defined as imaginary numbers by mankind. The imaginary number has been idle for a long time since it was discovered. Later, mathematicians such as Gauss moved the imaginary number to the mathematical plane (Complex plane). Humans have also ...

Mini Review

J/ (1S) and (2S) Production in p-p Collisions at E=5.44 TeV

Published On: May 20, 2023 | Pages: 063 - 064

Author(s): Leonard S Kisslinger*

I estimate the differential rapidity cross sections for J/ and (2S) via pp (proton-proton) collisions at E=510 GeV. The J/ is a standard charm quark and anti-charm quark, c and while (2S) is a mixed hybrid c meson. For the (2S) I use the mixed heavy quark hybrid theory, with states approximately 50% standard and 50% hybrid charmonium. ...

The fractal analysis - Powerful tool for geodynamic investigations

Published On: May 12, 2023 | Pages: 058 - 062

Author(s): Boyko Ranguelov*

This is a short review of fractal analysis applications in Bulgaria to investigate the geodynamics at the local, regional, and

global levels. ...

A remark on a perturbed Benjamin-Bona-Mahony type equation and its complete integrability

Author(s): Myroslava I Vovk, Petro Ya Pukach and Anatolij K Prykarpatski*

In the Letter, we study a perturbed Benjamin-Bona-Mahony nonlinear equation, which was derived for describing shallow water waves and possessing a rich Lie symmetry structure. Based on the gradient-holonomic integrability checking scheme applied to this equation, we have analytically constructed its infinite hierarchy of conservation laws, derived two compatible Poiss ...