Cosmic Rays And Particle Physics

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Snowmass Theory Frontier: Astrophysics and Cosmology

Sep 16, 2022 · Snowmass Theory Frontier: Astrophysics and Cosmology Daniel Green|?, Joshua T. Ruderman}†, Benjamin R. Safdi ‡, Jessie Shelton~§ |Department of Physics, University of California San Diego, La Jolla, CA 92093, USA}Center for Cosmology and Particle Physics, Department of Physics, New York University, New York, NY 10003, USA Department of …

1 Astronomical Observatory of the Jagiellonian University, ul
Aug 24, 2022 · general understanding of particle acceleration at mildly-relativistic shocks. 1. INTRODUCTION Relativistic jets launched from high-accretion rate Active Galactic Nuclei (AGN), such as quasars and high-excitation radio galaxies, terminate by forming powerful shock waves, observed as prominent hotspots at the edges of extended radio cocoons/lobes in

arXiv:2208.07880v1 [astro-ph.HE] 16 Aug 2022
Aug 18, 2022 · TABLE I. The cosmic-ray propagation parameters for the ISMmodelsthatweuse. model uncertainties in the ISM gas and the production e?ciency and injection spectra of primary cosmic rays. Finally, the solar modulation parameters ? 0 and ? 1 are marginalized over. Once including the cosmic-ray burst component, an additional normalization is used ...

New constraints on the dark matter-neutrino and dark matter …
Sep 15, 2022 · 1Department of Physics and McDonnell Center for the Space Sciences, Washington University, St. Louis, MO 63130, USA ... where the high energy neutrinos are produced together with gamma rays mainly via photopionprocesses[2,3,4,5]. ... i are respectively the

observed and emitted ?uxes of the particle i(i= or), and ...

1 3 arXiv:2208.11055v1 [astro-ph.GA] 23 Aug 2022
Aug 24, 2022 · 1Department of Physics and Astronomy, Michigan State University, East Lansing, ... 9Department of Physics and Astronomy and Pittsburgh Particle Physics, Astrophysics and Cosmology Center (PITT PACC), ... & Thompson2017;Zhang2018), accelerating cosmic rays (Drury et al.1994;Socrates et al.2008;Capri-oli et al.2010;Girichidis et al.2016), and ...

MSCA KEYWORDS - European Research Executive Agency
Nuclear physics Observational astronomy: cosmic rays, neutrinos, and other particles Particle physics Particles and fields physics Atomic, molecular physics Chemical physics Lasers, ultra-short lasers and laser physics Metrology and measurement Nonlinear optics Optics (including laser optics and quantum optics) Optics, non-linear optics and ...

Production of loosely-bound hadron molecules from …
cle physics as well: its presence in cosmic rays has been proposed as a low background detection channel for dark matter indirect searches [3], initiating vast and ongoing theoretical [4–6] and experimental [7–10] e?orts. Reduc-ing the uncertainties on its production rate in high en-ergy collisions is crucial to improve the modeling of both

arXiv:2208.12430v1 [hep-ph] 26 Aug 2022
Aug 29, 2022 · CONTENTS CONTENTS The SU(2)D lepton portals for muon g 2, W boson mass and dark matter Seong-Sik Kim1, Hyun Min Lee1, Adriana G. Menkara1* and Kimiko Yamashita 1 1 Department of Physics, Chung-Ang University, Seoul 06974, Korea. * amenkara@cau.ac.kr August 29, 2022 14th International Conference on Identi?cation of Dark Matter Vienna, …

The all-particle energy spectrum of cosmic rays from 10 TeV …
Aug 31, 2022 · SciPost Physics Submission The all-particle energy spectrum of cosmic rays from 10 TeV to 1 PeV measured with HAWC J. A. Morales-Soto1 and J. C. Arteaga-Velázquez1 on behalf of the HAWC collaboration. 1 Instituto de Física y Matemáticas, Universidad Michoacana de San Nicolás de Hidalgo * jorge.morales@umich.mx, juan.arteaga@umich.mx

arXiv:2208.11740v1 [astro-ph.HE] 24 Aug 2022
Aug 26, 2022 · -rays, as well as unstable quarks, leptons, and bosons whose interaction processes can produce secondary -rays. The full energy spectrum at production can be estimated with Monte Carlo (MC) simulations of the underlying particle physics. For this purpose, PYTHIA is …

10 Radio Detection

10.2 Radiodetection of cosmic particles Astrophysical neutrinos, cosmic rays, and gamma rays are excellent probes of astroparticle physics and high-energy physics [6]. High-energy and ultra- high-energy cosmic particles probe fundamental physics from the …

Nuclear Physics
[14N(n,p) C, the neutrons being produced by cosmic rays]. 14C decays by ?-emission with half life T 1/2 = 5730 y 14C ?14N + ?-+ ? The chemical activity of 14C is similar to that of 12C, so living organisms have the same 14C /12C ratio as in the atmosphere, which is about 1.35x10-12. When an organism dies it stops absorbing 14C, and the ratio

arXiv:2208.14300v1 [astro-ph.HE] 30 Aug 2022
Aug 31, 2022 · DAMPE (Dark Matter Particle Explorer) is a satellite-born experiment launched in 2015 in a sun-synchronous orbit at 500 km altitude, and it has been taking data in stable conditions ever since. Its main goals include the spectral measurements of cosmic electrons/positrons, protons, nuclei and gamma rays, up to very high energies.

Using TeV Cosmic Rays to probe the Heliosphere’s Boundary …
Sep 20, 2022 · arXiv:2209.08122v1 [astro-ph.HE] 16 Sep 2022 Using TeV Cosmic Rays to probe the Heliosphere’s Boundary with the Local Interstellar Medium Paolo Desiati1, Juan Carlos D´?az Ve´lez1,2, Gwenael Giacinti3, Francesco Longo4, Elena Orlando4,5, Nikolai Pogorelov6, Ming Zhang7 1 Wisconsin IceCube Particle Astrophysics Center (WIPAC), University of Wisconsin, …

MasteringPhysics: Assignment Print View - University of …
What kind of charged particle was transferred between the rod and the sphere, and in which direction? That is, did it move from the rod to the ... that have been kicked out of atoms by cosmic rays. If an electric field is present, a free electron is accelerated until it collides with an air molecule. It will transfer its kinetic energy to the ...

A Concise Introduction to Astrophysics - NTNU
– Observation of neutrinos from the Sun and produced by cosmic rays in the Earth’s atmosphere gave in the 1990’s ?rst ?rm evidence that neutrinos have non-zero ... model of elementary particle physics. The same holds true for a new form of ”dark energy” required for the explanation of the accelerated expansion of the universe.

No room to hide: implications of cosmic-ray upscattering for …
3Theoretical Physics Department, CERN, 1211 Geneva 23, Switzerland 4Department of Mathematics and Physics, University of Stavanger, 4036 Stavanger, Norway E-mail: j.b.g.alvey@uva.nl, torsten.bringmann@fys.uio.no, helena.kolesova@uis.no Abstract: The irreducible upscattering of cold dark matter by cosmic rays opens up the

Probing Quantum Gravity with Elastic Interactions of Ultra …

Sep 15, 2022 · of UHE cosmic rays with the cosmic microwave back-ground [4,5] and a variety of astrophysical contexts (see, e.g., Refs. [3,6] and references therein), they have not been detected. IceCube has identi ed neutrinos of as-trophysical origin in the PeV energy range [7,8], yet no experiment has claimed detection of events with higher energies.

Teruyoshi Kawashima for The ALPACA Collaboration
Sep 01, 2022 · The Andes Large area PArticle detector for Cosmic ray physics and Astronomy (ALPACA) collaboration aims to demonstrate the ?rst sub-PeV gamma ray observations in the southern hemisphere using an air-shoer-array detector. The array is going to be construct in Bolivia and plans to start observations in 2024.

Chapter 12 –Radioactivity
• Gamma rays are not charged particles like a and b particles. • Gamma rays are electromagnetic radiation with high frequency. • When atoms decay by emitting a or b particles to form a new atom, the nuclei of the new atom formed may still have too much energy to be completely stable. • This excess energy is emitted as gamma rays

The KM3NeT infrastructure: status and ?rst results - arXiv
core collapse supernovae, and particle physics topics like the investigation of neutrino properties, in particular the de?nition of neutrino mass ordering (NMO) through the measurement of matter ... Only with accurate statistical analyses a cosmic ?ux can be identi?ed, either looking for clusters of events over the atmospheric background ...

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¶National Institute of Physics and Nuclear Engineering, Bucharest, Romania ... radio detection, cosmic rays, air showers, LOPES PACS: 96.50.sd, 95.55.Jz 1 Corresponding author Email address: daniel.huber@kit.edu. ... radio emission from cosmic ray induced air showers is a transverse wave, consequently the component of the electric ...

a,b a a,b a, - arxiv.org
Sep 21, 2022 · The Dark Matter Particle Explorer (DAMPE) is designed as a high energy par- ... iment for high energy cosmic-ray and -ray observations [1,2], was launched ... arXiv:2209.09440v1 [physics.ins-det] 20 Sep 2022. of the incident charged particle and converts ray into electron and positron pairs [6,7]. The BGO imaging calorimeter [8], which is of ...

Practical use of reactor anti-neutrinos for nuclear safeguard in …
Sep 09, 2022 · important role in exploring the fundamentals of neutrino particle, including but not limited to the discovery of neutrino [2] and precision of mixing angle q 13 [6]. Still the medium-baseline ex-periment like JUNO [36] can help us to determine the neutrino mass ordering, which is one the unanswered questions of the neutrino physics.

A novel Cherenkov radiation constraint for hybrid MOND dark …

High-energy cosmic rays then lose energy due to Cherenkov radiation, which constrains such models. This is also true for some MOND (Modi?ed Newtonian Dynamics) models. However, these ... In particle physics language, Cherenkov radiation corresponds to the Feyn-man diagram shown in Fig.1. A direct coupling to matter implies that the vertex in this