Reading Log

Xin Cheng Liu

Week 1 - 12/11/2025

Paleodetectors for Galactic supernova neutrinos, 2020 - Cited by 36

A Supernova at 50 pc: Effects on the Earth's Atmosphere and Biota, 2017 - Cited by 75

The lunar surface as a recorder of astrophysical processes, 2021 - Cited by 32

- Review on using the lunar surface as a recorder for solar and galactic cosmic rays
- Preservation of records:
  - eruption of low-viscosity basaltic lava flow
  - deposition of pyroclastic deposits around sites of explosive volcanism
  - emplacement of impact crater ejecta blankets
- Locating and accessing records in subsurface layers

Week 2 - 19/11/2025

Lunar sourcebook: A user's guide to the Moon, 1991 - Cited by 2610

- Chapter 3: Galactic Cosmic Rays
  - GCR particles with energies below 1015 eV come from our galaxy, and their flux at the Earth is very isotropic (Simpson, 1983)
- Chapter 5: Lunar Minerals

Cosmic-ray-produced noble gases in meteorites, 2002 - Cited by 242

- THE COSMIC RAY FLUX IN TIME page 159

Nuclear tracks: A success story of the 20th century, 2001 - Cited by 63

- Review on how nuclear tracks have been used in various fields and potential future studies

Cosmic-Ray Record in Solar System Matter, 1983 - Cited by 262

- The heliosphere is one of three screens, together with the Earth's magnetic field and the Earth's atmosphere, that modulate the cosmic ray flux at the surface of the Earth.
- The loss of heliospheric modulation would lead to flux increases of 10–100× at energies of 10–100 MeV at the top of the terrestrial magnetosphere

The Local Interstellar Medium, 2006 - Cited by 33

- If we look at a very nearby star, in the direction of the historical solar trajectory (Dehnen & Binney 1998), the observed LISM absorption should provide information on the nature of the LISM that the Sun encountered only a short time ago.
- The Sun's ISM history could then be converted into a cosmic ray flux history, based on the heliospheric response to the historical interstellar density profile.

Duration of Sensitive Period for Track Recording in Mica, 1968 - Cited by 24

The observation in mica of tracks of charged particles from neutrino interactions, 1967 - Cited by 30

Identification and selection criteria for charged lepton tracks in mica, 1988 - Cited by 48

Week 3 - 26/11/2025

The observation in mica of tracks of charged particles from neutrino interactions, 1967 - Cited by 30

- Mica exhibit internal decoration of oxides of iron. Random spots and sets of straight lines in 001.
- Majority of lines orientated in directions related directly to the crystal internal structure.
- Small minority exist which are orientated essentially at random.
- Suggests the minority is caused by passage of charged high energy particles through the crystal during a particular stage in the history of the crystal.

Ancient Cosmic Ray Tracks in mica?, 1968

- Comments on "The observation in mica of tracks of charged particles from neutrino interactions"
- Expecting:
  - Their distribution should be consistent with that expected for neutrino-induced muons, i.e. nearly isotropic at the energies in question or, alternatively, if the depth were such that the charged particles could be atmospheric muons, then the distribution should be consistent with the known sharp angular distribution for this component.
  - Their lack of straightness should be consistent with the effect of Coulomb scattering; thus, the distribution in scattering angle for successive segments of track should be near Gaussian with only a very small single scattering 'tail'.
- Minority lines don't appear to be random. Two preferred directions between 3 and 4° and the other between 6 and 7°.
- Orientation measurements supports the first requirement for genuine tracks.
- Scattering is not due to Coulomb scattering but could be Rutherford scattering.
- Not been able to substantiate the suggestion by Russell that the minority lines are tracks left by neutrino-induced muons or by any other kind of charged particles.

Week 4 - 03/12/2025

Week 5 - 10/12/2025

Week 6 - 17/12/2025