

The Sun's Origin and Source of Energy

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The Sun's origin, composition, and source of energy are critical because it accounts for about 99.8% of all material in the solar system and serves as a model of other stars. Its most abundant element, iron, was noted at the 31st annual meeting of the mid-America regional astrophysics conference and in the literature [1,2]. Inter-linked elemental and isotopic variations in meteorites, planets, the solar wind and solar flares suggest that the Sun and some second generation stars may have formed on the collapsed core of supernovae, and iron-rich debris formed rocky planets around these and pulsars [3]. We used systematics of the 2850 known nuclides to show that neutron emission from this compact object at the center of the Sun may initiate a series of reactions that produce solar luminosity, solar neutrinos, and an outpour of protons in the solar wind. Earlier circularly polarized light from this neutron star likely initiated homochirality in the molecules of living creatures [4].

REFERENCES

- [1] Manuel O. in *Origin of Elements in the Solar System: Implications of Post-1957 Observations*, Proceedings of the 1999 ACS Symposium organized by Glenn T. Seaborg and Oliver K. Manuel (Kluwer Academic/Plenum Publishers, New York, 2000) See pp. 279-287, 589-643, and references therein.
- [2] Manuel O. and Bolon C. (2002) *J. Radioanal. Nucl. Chem.* **251**, 381-385.
- [3] Wolszczan A. (1994) *Science* **264**, 538-542.
- [4] Cronin J. R. and Pizzarello S. (1997) *Science* **275**, 951-955.