

# Capture theory of the solar system

**SOLAR SYSTEM: ORIGIN.** The fundamental principles of the capture theory of solar-system formation (SSF) proposed by Woolfson (1964) are reviewed, and the modifications and ...

Solar system - Origin, Planets, Formation: As the amount of data on the planets, moons, comets, and asteroids has grown, so too have the problems faced by astronomers in forming theories of the origin of the solar system. In the ancient world, theories of the origin of Earth and the objects seen in the sky were certainly much less constrained by fact. Indeed, a ...

Capture theory suggests that the Moon was a wandering body (like an asteroid) that formed elsewhere in the solar system and was captured by Earth's gravity as it passed nearby. The accretion hypothesis proposes that the Moon was created along with Earth at its formation.

A theory of the origin of the Solar System is described which involves the capture of material from a light diffuse star which passed close to the Sun. It is shown that planetary condensations could be formed and that these would take up orbits with radii having the required range of values. 1. INTRODUCTION

Woolfson's tidal capture theory involving the Sun and a cool low-mass protostar. Today, the most widely-accepted model of the formation of our own solar system, which extends to the basic paradigm of exoplanet formation more generally, is referred to as the "solar nebula hypothesis". According to this understanding, planets formed

This fully-updated second edition remains the only truly detailed exploration of the origins of our Solar System, written by an authority in the field. Unlike other authors, Michael Woolfson focuses on the formation of the solar system, engaging the reader in an intelligent yet accessible discussion of the development of ideas about how the Solar System formed from ...

The origin of the solar system has been a matter of speculation for many centuries, and since the time of Newton it has been possible to apply scientific principles to the problem. ... The capture theory put forward by the author fares better and also indicates an initial scenario leading to a causal series of events that explain all the major ...

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In a scenario produced by the Capture Theory of planetary formation, a collision between erstwhile solar-system giant planets, of masses 798.75 and 598.37  $M_{\oplus}$ , is simulated using smoothed ...

His parallel work on the origin of the Solar System renewed interest in the Capture theory, and he contributed

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numerous stimulating ideas to the general study of the origin and dynamical evolution of the Solar System. ... The origin of the Solar System: the Capture theory . This gave rise to a set of interesting intellectual exchanges with ...

18. M.M. Woolfson's capture theory (Figure 4) is a variation of James Jeans' near-collision hypothesis. In this scenario, the Sun drags from a near proto-star a filament of material which becomes the planets. Collisions between proto-planets close to the Sun produced the terrestrial planets; condensations in the filament produced the giant planets and their satellites.

The Capture Theory is not, however, stated in so precise a form as the Planetesimal Theory. It is not definitely stated whether all the small particles would revolve in the same direction or not. If they did, then there would be little or no secular effect on the mean distance of a planet.

The three-dimensional point-mass model of Dormand and Woolfson (1971) of the capture by the sun of material from a passing protostar is given further development to see how it can account for the formation of planets from the captured filament. For a passing protostar of mass 0.25 solar mass and radius 2.5 times  $10^{10}$  to  $10^{11}$  cm, a filament is formed which will form six ...

relevance to the capture idea as a theory of the origin of the Solar System but they represent only a tiny sample of the many computations which were carried out. The capture process does not depend on some delicately balanced set of parameters; one can make the general statement that when any light diffuse star and heavier con-

London: Royal Society, 1964. 1st Edition. HANDSOME FIRST EDITION OF MICHAEL WOOLFSON'S CAPTURE THEORY, PROPOSING THAT THE SOLAR SYSTEM FORMED THROUGH THE CAPTURE OF MATERIAL FROM A DIFFUSE STAR THAT PASSED CLOSE TO THE SUN."In 1964, a capture theory of the origin of the solar system was put forward by ...

The formation and evolution of the solar system has puzzled great astronomers and astrophysicists for centuries and is responsible for the creation of multiple theories to explain how the solar system originated. The major theories that have survived are Laplacian theory, Solar nebula theory, capture theory and proto-planet theory. The accretion theory also has some ...

Capture theory is another prominent hypothesis that attempts to explain the origin of the Solar System. This theory was first proposed by British physicist Michael Mark Woolfson (b. 1927) in the 1960s. According to Woolfson, the Solar System may have formed as a result of interaction between the Sun and a protostar, which is a star in its early ...

The condensation of planets under the conditions of Woolfson's capture theory of the origin of the solar system is described. It is shown that material captured by the Sun, during an encounter with another star, would probably not recondense to form planets under the conditions originally specified. Different star

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encounters are studied using numerical analysis, and it is shown that ...

Capture theory is one of the four theories to explain how the Moon formed. Capture theory states that the Moon formed somewhere else in the Solar System but traveled too close to Earth and became ...

The most widely accepted model of planetary formation is known as the nebular hypothesis. This model posits that, 4.6 billion years ago, the Solar System was formed by the gravitational collapse of a giant molecular cloud spanning several light-years. Many stars, including the Sun, were formed within this collapsing cloud. The gas that formed the Solar System was slightly more ...

The theory to be described here combines elements of the tidal and accretion theories. It offers a complete description and explanation of the properties of the Solar System in terms of a ...

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The answer to the question that forms the subject of this chapter was given in Chapter 1 -- no theory can ever be designated as true. This is not just being evasive, like not answering the question ...

A capture theory of the origin of the Solar System By M. M. WOOLFSON Physics Department, College of Science and Technology, Manchester ... P.R.S.-Received 7 February 1963-Revised 27 April 1964) A theory of the origin of the Solar System is described which involves the capture of material from a light diffuse star which passed close to the Sun ...

In the alternative binary-exchange capture theory, the researchers said, Earth's gravity separated the binary, snagging one of the objects -- the moon -- and making it a satellite that orbits in its current plane. ... Milky joined the solar system, they are not actually moons, the planets were small stars of the arm of the Milky Way galaxy ...

The Capture Theory gives planet production through a tidal interaction between a condensed ... This was the standard theory of the formation of the Solar System for two decades. Although similar mechanisms occur in the CT it is in a completely different context. Figure 2 shows a CT simulation using SPH with radiation transfer (Oxley and ...

Once a leading theory of the origin of the Earth-Moon system, the Capture Theory possessed the virtues of simplicity and intuitive plausibility. The numerous. ... However, the Moon would have had to come from a different part of the solar system to account for its very depleted iron compared to the Earth's iron, which meant that it would ...

The Capture Theory gives planet formation through a tidal interaction between a condensed star and a



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protostar within a dense embedded stellar cluster. Initial extensive and highly eccentric planetary orbits decay and usually round-off in circumstellar material captured from the protostar.

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