



K.D.K. College of Engineering

Department of Electrical Engineering



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VISION

To impart quality technical education for developing competent electrical engineers capable of accepting challenges of the modern society.

MISSION

- M1 To provide an adoptive academic environment with a continuous motivation to budding electrical engineers for making them academically excellent and technically competent having good managerial skills to fulfill the expectations of industries for developing sustainable solutions.
- M2 To work for all round growth of students having good moral values in a dedicated manner.
- M3 To inculcate a sense of responsibility among the students for well being of the society.

PROGRAM EDUCATIONAL OUTCOMES (PEO)

- To develop graduate engineers with sound technical knowledge and all round personalities ready to pursue high level academic career.
- To produce graduate engineers with broad based trainings to cater to the requirements of modern electrical industries and ready for working as electrical consultants.
- To produce graduate engineers having sensitivity towards global environmental issues and sustainable developments through use of renewable energy sources.

PROGRAM SPECIFIC OUTCOMES (PSO)

The Department of Electrical Engineering will prepare the graduate engineers having:-

- Technical and managerial skills necessary to enter careers in design, application, installation, manufacturing, testing, operation and/or maintenance of electrical systems.
- Knowledge of information technology skills including word processing, spread sheet, power point presentation, electrical system simulation, computer programming, internet/library research and electrical CAD drawing encouraging and increasing one's abilities for lifelong learning.

Jupiter's precocious birth happened in the solar system's first million years



Jupiter was an early bloomer. New measurements of meteorite ages suggest that the giant planet's core must have formed within the solar system's first million years. If so, Jupiter's presence could help explain why the inner planets are so small and possibly even be responsible for Earth's existence.

Previously, astronomers' best constraints on Jupiter's age came from simulations of how solar systems form in general. Gas giants like Jupiter grow by accreting gas from spinning disks of gas and dust around a young star. Those disks typically don't last more than 10 million years, so astronomers inferred that Jupiter formed by the time that disk dissipated.

"Now we can use actual data from the solar system to show Jupiter formed even earlier," says Thomas Kruijer, who did the research while at the University of Münster in Germany. Kruijer, now at Lawrence Livermore National Laboratory in California, and his team report Jupiter's new age in the Proceedings of the National Academy of Sciences this week of June 12.

To study one of the biggest objects in the solar system, Kruijer and colleagues turned to some of the smallest: meteorites. Most meteorites come from the asteroid belt currently located between Mars and Jupiter but probably were born elsewhere. Luckily, meteorites carry a signature of their birthplaces. The gas and dust disk that the planets formed from had different neighborhoods. Each had its own "zip code," areas enriched in certain isotopes, or different masses of the same elements. Careful measurements of a meteorite's isotopes can point to its home. Kruijer and colleagues selected 19 samples of rare iron meteorites from the Natural History Museum in London and the Field Museum in Chicago. These rocks represent the metal cores of the first asteroid-like bodies to congeal as the solar system was forming.

The team dissolved about a gram of each sample in a solution of nitric acid and hydrochloric acid. "It smells terrible," Kruijer says. Then the researchers separated out the elements tungsten a good tracer of both a meteorite's age and birthplace and molybdenum,

another tracer of a meteorite's home. By measuring the relative amounts of molybdenum-94, molybdenum-95, tungsten-182 and tungsten-183, Kruijer and his team identified two distinct groups of meteorites. One group formed closer to the sun than Jupiter is today; the other formed farther from the sun.

The tungsten isotopes also showed that both groups existed at the same time, between about 1 million and 4 million years after the start of the solar system about 4.57 billion years ago. That means something must have kept them separated. The most likely candidate is Jupiter, Kruijer says. His team's calculations suggest that Jupiter's core had probably grown to about 20 times the mass of the Earth in the solar system's first million years, making it the oldest planet. Its presence would have created a gravitational barrier that kept the two meteorite neighborhoods segregated. Jupiter would then have continued growing at a slower rate for the next few billion years. "I have high confidence that their data is excellent," says cosmochemist Meenakshi Wadhwa of Arizona State University in Tempe. The suggestion that Jupiter held the different meteorites apart is "a little more speculative, but I buy it," she adds.

Jupiter's early entrance could also explain why the inner solar system lacks any planets larger than Earth. Many extrasolar planetary systems have large close-in planets, from rocky super-Earths (about two to 10 times the mass of Earth) to gassy mini Neptunes or hot Jupiters. Astronomers have puzzled over why our solar system looks so different. An early Jupiter's gravity could have kept most of the planet-forming disk away from the sun, meaning there was less raw material for the inner planets. This picture is consistent with other work suggesting a young Jupiter wandered through the inner solar system and swept it clean Kruijer says.

"Without Jupiter, we could have had Neptune where Earth is," Kruijer says. "And if that's the case, there would probably be no Earth."

MOTIVATIONAL THOUGHTS

- To be a leader, you must stand for something, or you will fall.
- Anonymous

- Success is the prize for those who stand true to their ideas.
- John S. Hinds

- Believe in yourself and you will be unstoppable.
- Emily Guay

- Never give up! Failure and rejection are only the first step to succeeding.
- Jimmy Valvano