The Scientific Path to a New Clean Energy Source

Fusion takes place in the sun as hydrogen atoms combine to make energy. Inside the sun, gravity holds gases tightly together to reach high temperatures enabling fusion.

On earth, this process is recreated in a magnetic chamber known as a tokamak, where temperatures over 200,000,000 °C have been achieved – 10 times hotter than those of the sun.

DIII-D – the largest fusion facility in the U.S. and one of the most capable tokamaks in the world – is tackling the great scientific challenge of bringing star power to earth to create a clean, safe, and virtually unlimited energy source.
DIII-D NATIONAL FUSION FACILITY

Award-winning Science Advancing New Energy and Technology Research and Development

- Seven-time winner of the “John Dawson Award for Excellence in Plasma Physics Research” from the American Physical Society – the most such awards received by any facility or research team in the world
- 65 Fellows of the American Physical Society
- Major breakthroughs in physics, advancing the quest for fusion and its promise of a clean, unlimited energy supply

A novel Imaging Neutral Particle Analyzer measures neutralized fast ions escaping from the DIII-D tokamak plasma, allowing detailed studies of the impact of waves and other perturbations. This new diagnostic tool has an unprecedented combination of energy and spatial resolutions and could revolutionize measurements of confined fast-ion profiles in fusion experiments.

Flagship Fusion User Facility for the DOE Office of Science

- More than 650 collaborating researchers from more than 100 institutions worldwide
- Partnerships with seven U.S. national laboratories
- 40 universities among collaborators with more than 80 doctoral theses produced
- Over 100 current graduate students and post-doctoral users

Key Provider of Innovations for Fusion and Spinoff Technologies

- **Fusion**: DIII-D research has pioneered multiple new approaches to producing and handling fusion-grade plasmas using a unique and very flexible combination of plasma shaping, heating, control, and measurement capabilities
- **Spinoffs**: Fusion research continually leads to vital scientific discoveries and spinoff technologies, from MRI medical diagnostics to maglev transport to semiconductors and electronics, including the next-generation Electromagnetic Aircraft Launch System (EMALS) used on the USS Gerald R. Ford

Enabling the U.S. to Capitalize on Global Investment in Fusion Energy

- DIII-D is the world leader in resolving critical design issues for ITER, under construction in France by an unprecedented scientific partnership of 35 nations, including the U.S., with the goal of demonstrating the feasibility of fusion power
- DIII-D collaborators include scientists from China, Europe, Japan, Korea, Russia, India, Australia, and Canada, enabling strategic U.S. engagement in fusion programs worldwide
- Fusion programs in China and Korea are contributing hardware components directly to DIII-D and enabling new capabilities not possible with U.S. funding alone

Cross-section of the ITER fusion reactor

Dave Hill, DIII-D National Fusion Facility
Ph: 858-455-3234 | E: hilldn@fusion.gat.com

GENERAL ATOMICS   3550 General Atomics Court, San Diego, CA 92121, USA   WWW.GA.COM