



The mission of Abilene Christian University's NEXT Lab is to provide global solutions to the world's need for energy, water and medical isotopes by advancing the technology of molten salt reactors while educating future leaders in nuclear science and engineering.



ABILENE  
CHRISTIAN  
UNIVERSITY



TEXAS  
The University of Texas at Austin



Georgia Institute  
of Technology



TEXAS A&M  
UNIVERSITY

### CHANGING THE WORLD

Nuclear power is already the safest and cleanest energy source in the world, but it can still be improved. By cooling with molten salt and providing fuel in liquid form, advanced reactors will be even safer, produce no carbon emissions, increase efficiency and decrease waste, all while making electricity more affordable. In addition, the Molten Salt Research Reactor (MSRR) will naturally produce isotopes that are needed for treating cancer but are not found in nature.

NEXT Lab, sponsored by Natura Resources, is building the first advanced university research reactor, the Natura Resources MSR-1. This 1 MWth liquid-fueled molten salt reactor is being licensed at ACU as the MSRR. The Natura Resources Research Alliance – ACU, Texas A&M University, The University of Texas at Austin and the Georgia Institute of Technology – is designing, building and licensing the MSR-1 system.

### THE RIGHT PLACE, THE RIGHT TIME

ACU is well positioned to contribute to advanced nuclear research in significant ways, having been named among the top 50 universities nationally for undergraduate research by *U.S. News & World Report*.

Through NEXT Lab, students are testing advanced instrumentation, evaluating salt properties, making data measurements and testing hardware for use with molten salts. The collaboration engages undergraduates majoring in physics, engineering, chemistry, mathematics, computer science, finance and advertising/public relations. ACU's research facilities provide unprecedented access for students and faculty to conduct cutting-edge research to solve some of the world's most pressing problems.

The Dillard Science and Engineering Research Center at ACU is the nation's first advanced reactor demonstration facility. The \$23 million, 28,000-square-foot building features a 6,000-square-foot research bay with a 25-foot-deep by 80-foot-long shielded trench and a 40-ton crane, as well as a training control room, conference room, office spaces, machine shop, and a series of specialized labs.





# NEXT HISTORY

**2015** After several years of research into sustainable energy sources, Dr. Rusty Towell, ACU professor of engineering and physics, presented findings at a TEDxACU talk titled “Why Making Energy From Dirt Might Save the World.” His talk sparked interest in funding and support for future research.

**2016** NEXT Lab officially formed.

**2018** The Development Corporation of Abilene approved \$300,000 in research and development funding for NEXT Lab, and the first full-time staff member was hired. Just a few months later, \$3.2 million was contributed by the Robison Excelsior Foundation, and salt flowed through a molten salt test loop for the first time. Officials from the U.S. Department of Energy toured NEXT and requested follow-up visits in Washington, D.C.

**2019** ACU hosted research workshops for partner universities in March and October. In November, the U.S. Department of Energy issued a Letter of Support for the MSRR.



**2020** Natura Resources announced funding of \$21.5 million to ACU. NEXT Lab submitted a Regulatory Engagement Plan to the Nuclear Regulatory Commission (NRC).

**2021** NEXT Lab installed a second molten salt test system in its on-campus facility in Abilene, Texas.

**2022** ACU submitted the construction permit application to the NRC – the first advanced reactor construction permit application accepted for a university research reactor.

**2023** The Gayle and Max Dillard Science and Engineering Research Center opened.



**2024** The NRC approved the construction permit for the MSSR, marking the first liquid-fueled molten salt reactor ever approved for construction by the NRC.

