

METAL-ORGANIC FRAMEWORKS

Catalysts for a Cleaner Environment



ARTIFICIAL PHOTOSYNTHESIS

Neutrons can identify lighter molecules and study molecular motions over time, such as in catalysts — substances that facilitate chemical reactions. Catalysts are being developed to help provide green methods for hydrogen storage, advanced biofuels, and for processes such as carbon capture and storage.

NATURAL GAS TO LIQUID METHANOL

January

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February

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				4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

March

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					3	4
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19	20	21	22	23	24	25
26	27	28	29	30	31	

April

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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May

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16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

June

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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

Proposal Call 2024-B is scheduled to close February 28, 2024.

Proposal Call deadlines are subject to change based on facility schedule changes. The User Office will communicate any date changes on the website and in the user newsletter.

Alloys for Lighter, More Durable Structures



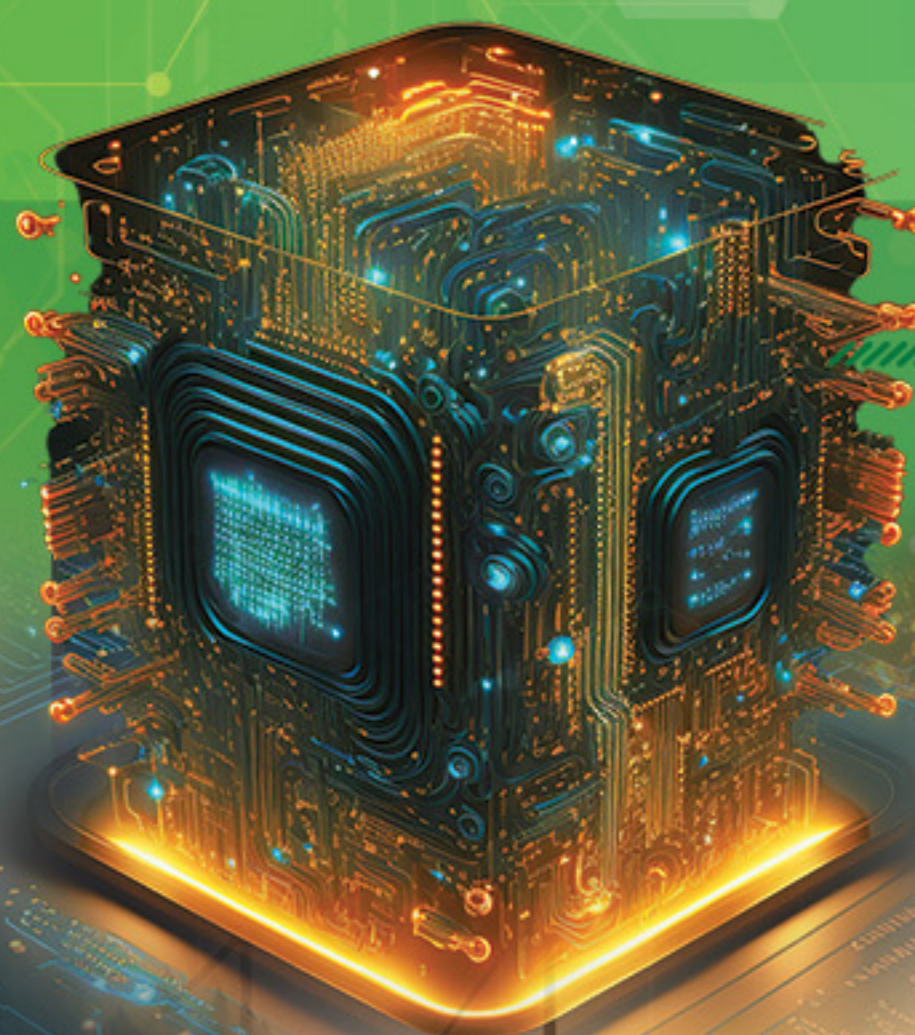
WELD QUALITY

Neutrons can penetrate dense materials under extreme conditions, helping accelerate the development of lighter and stronger metal alloys for materials and engineering applications. Innovative alloys will help boost energy efficiency, durability and performance across a broad range of products.

BUILDING MATERIALS

3D PRINTING

QUANTUM COMPUTING



ENERGY SAVINGS

The magnetic properties of neutrons enable studying atomic-scale magnetism inside materials such as superconductors, which conduct electricity without energy loss. Neutrons can penetrate dense metals in the search for superconductors that work near room temperature — a discovery that could solve the world's energy problems.

HIGH-SPEED TRANSPORTATION



Superconductors to Solve the Global Energy Crisis

2024

NEUTRON SCIENCES AT OAK RIDGE NATIONAL LABORATORY

July

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21	22	23	24	25	26	27
28	29	30	31			

August

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

September

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October

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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

November

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17	18	19	20	21	22	23
24	25	26	27	28	29	30

December

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Proposal Call 2025-A is scheduled to close August 14, 2024.

Proposal Call deadlines are subject to change based on facility schedule changes. The User Office will communicate any date changes on the website and in the user newsletter.

ARTIFICIAL INTELLIGENCE

Neutrons easily locate hydrogen molecules to help study lipids and proteins in biological membranes. This research is leading to advances in medicines, biofuels and neuromorphic computing — computing that mimics the human brain. Neutrons can also help study the industrial membranes needed to lower drug and production costs.

MEMBRANE FILTRATION

Membranes for Making Drugs and Biofuels

BIOMANUFACTURING

INFINITELY RECYCLABLE PLASTICS

PLANT-BASED PLASTICS

SELF-HEALING MATERIALS

Upcycling to Eliminate Plastic Waste

Safer, Longer-Lasting Batteries

SOLID-STATE & LITHIUM-ION

Neutrons can penetrate deeply into materials and track light elements, such as the lithium used in batteries. These capabilities allow observing a battery's internal structures and activities during charging and discharging while in operation under a wide variety of working conditions. This research will help develop batteries that are safer, longer-lasting and more powerful.

ELECTRODE-ELECTROLYTE INTERFACES

ELECTRICAL ENERGY STORAGE

Neutrons are nondestructive because they interact weakly with materials, which enables observing polymer molecules during upcycling — the process of transforming plastic waste into new, high-quality polymer materials. Studying how plastic waste changes during upcycling will advance the development of plant-based plastics and other eco-friendly materials.