# SMART TECHNOLOGIES IN SCIENCE AND ART

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AI and robotic automation in modern research labs can massively accelerate experiments – processes that once took days or years can now be completed in minutes (ORNL, 2023).

Autonomous lab robots can operate safely and continuously (24/7) without human error, significantly increasing the efficiency and safety of experimental work (ORNL, 2022).

The "Internet of Robotic Things" (IoRT) concept integrates IoT sensors with robotic agents to form smart, autonomous networks of devices, boosting operational efficiency and autonomy in scientific and industrial systems (TechBriefs, 2023).

Smart automation (exemplified by ORNL's INTERSECT initiative) streamlines research by automating repetitive tasks and standardizing tools, effectively "supercharging" scientific discovery across multiple fields (ORNL, 2023; TechBriefs, 2023).

AI-driven data analysis is transforming scientific observation; for example, the DeepDISC deep learning system can automatically detect and classify stars and

galaxies in telescope images, greatly accelerating astronomical surveys (Lukasiewicz et al., 2023; NCSA, 2024).

AI is also revolutionizing art as a creative partner: modern interactive artworks can include autonomous "co-creator" agents that adapt dynamically to viewer input (Kohonen & Lee, 2024).

Experts note that AI is already a powerful artistic tool and partner for creators, and that the development of "aesthetically sensitive" AI machines will challenge traditional ideas of beauty, creativity, and what constitutes art (Scientific American, 2025).

Generative AI platforms (e.g., DALL·E, Midjourney, ChatGPT) are democratizing art by enabling lay users to produce high-quality images, music, and text from simple prompts, greatly broadening access to creative expression (Scientific American, 2025).

These smart creative tools bring significant benefits but also challenges: while they offer augmented creativity and productivity, they raise legal and ethical issues (data privacy, copyright, misinformation) that the art community is actively debating (Scientific American, 2025).

Augmented Reality (AR) is increasingly used to create immersive art experiences (such as museum exhibits), overlaying digital content onto real-world objects to engage audiences with interactive, educational displays that "bring collections to life" (Kohonen & Lee, 2024).

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