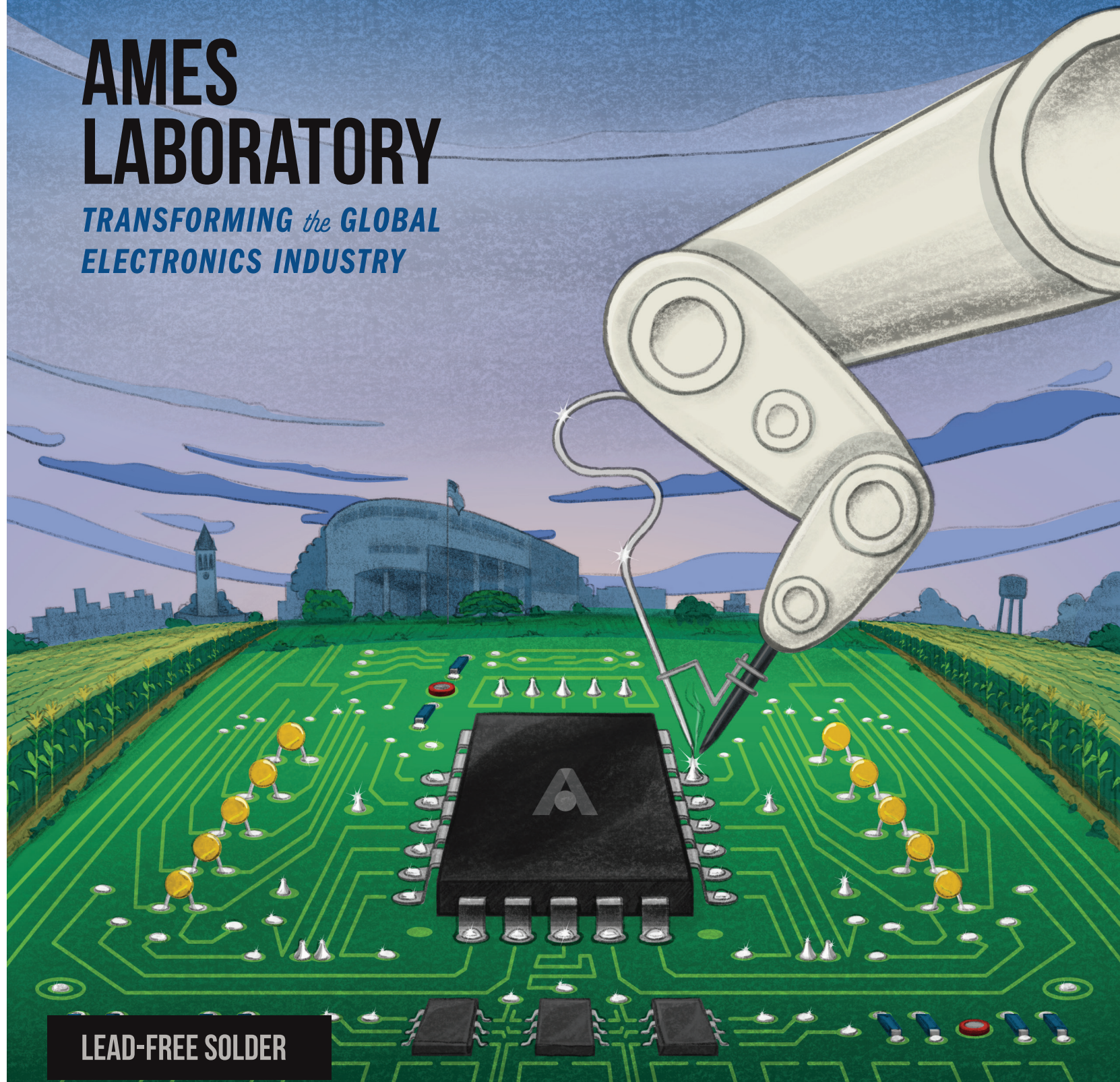


ADVANCING AMERICA *through* TECHNOLOGY TRANSFER

# AMES LABORATORY

*TRANSFORMING the GLOBAL  
ELECTRONICS INDUSTRY*



LEAD-FREE SOLDER

**SAFER MANUFACTURING**  
*and a*  
**CLEANER ENVIRONMENT**

**AMES**  
LABORATORY

U.S. DEPARTMENT OF  
**ENERGY**

Office of  
**TECHNOLOGY TRANSITIONS**





## How can we save the environment and advance industry?

Scientists at Ames National Laboratory discovered a cost-effective and non-toxic alloy replacement to the millennia-old highly toxic lead solder. Lead soldering was the norm of the electronics industry up until the early 1990s when concerns arose regarding electronics disposal and the potential for lead leeching from landfills into the environment.

The Ames discovery of a safe, effective alternative to lead solder drove sweeping international adoption and licensing by the multibillion-dollar electronics industry and protects the environment, human health, and economy on a global scale.

### Ames Lab at a Glance

Ames Laboratory's central location on the campus of Iowa State University fosters a decades-old collaborative relationship that inspires minds to create materials, solve problems, and address global challenges. A leader in the discovery, synthesis, analysis, and use of new materials, novel chemistries, and transformational analytical tools, Ames Laboratory seeks solutions to energy-related problems of national concern through the exploration of physics, chemistry, engineering, applied mathematics, and materials sciences.

### U.S. Department of Energy National Laboratories

The 17 U.S. Department of Energy (DOE) National Laboratories comprise a preeminent federal research system that executes long-term government scientific and technological missions, often with complex security, safety, project management, or other operational challenges. The National Laboratory system produces the scientific research needed to develop national energy policy and solutions allowing DOE to be one of the largest supporters of technology transfer in the federal government.

### Technology Transitions

The mission of the Office of Technology Transitions (OTT) is to expand the commercial impact of the DOE's research and development portfolio to advance the economic, energy, and national security interests of the Nation. The office develops the Department's policy and vision for expanding the commercial impact of its research investments, and streamlines information and access to DOE's National Labs and sites to foster partnerships that will move innovations from the labs into the marketplace.

[www.energy.gov/technologytransitions](http://www.energy.gov/technologytransitions)

### Ames Laboratory's most successful commercial technology transfer

#### Technology

A tin-silver-copper replacement for traditional lead solder.

#### Industry

Widely adopted as an alternative to lead solder and preferred by the worldwide electronics assembly industry.

#### Economy

Generated close to \$60 million in licensing revenue.

### Contact Us

The scientific discovery highlighted on this poster is just one of DOE's many successes advancing America.

Learn more about available resources and partnering opportunities with the National Labs by visiting:

[www.energy.gov/technologytransitions](http://www.energy.gov/technologytransitions)

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