

*2019 NSF STC Virtual Site Visit
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Wrap-up & Legacy

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A Science & Technology Center

Berkeley
UNIVERSITY OF CALIFORNIA

**Massachusetts
Institute of
Technology**

STANFORD
UNIVERSITY

THE UNIVERSITY OF
TEXAS AT EL PASO

FLORIDA
INTERNATIONAL
UNIVERSITY

CALIFORNIA COMMUNITY COLLEGES
CHANCELLOR'S OFFICE



Center for Energy Efficient
Electronics Science

Beyond 2020: E³S Legacy Update Report

1. *Berkeley Emerging Technology and Research (BETR) Center*
2. *Negative Capacitance Industry-Supported Center*
3. *Graphene Nanoribbons MURI*
4. *Semiconductor Research Corporation (SRC) JUMP Centers*
5. *Nanophotonics NSF ERC Proposal*



Beyond 2020: E³S Legacy Update Report- Education Legacy

1. *E3S e-Book*
2. *E3S nanoHUB Website*
3. *TTE Renewal Grant*
4. *Third-Party Support*
5. *TTE-2.0 Proposal*



Research Legacy on Future Technology:

In addition to a legacy represented by continuing research organizations, E³S prides itself on the scientific influence it will continue to have on the future science & technology of energy efficient electronics.

Theme 1 has found that tunnel-Field Effect Transistors will be much more challenging to create, than expected. Nonetheless, Theme 1 has laid out the requirements that will guide future research, including atomic scale perfection, and non-Lorentzian spectral lineshape, arising from narrow-band metallic, organically synthesized graphene nano-ribbons.

Theme 2 has demonstrated the importance of molecular functionalization on the surfaces of nano-electro-mechanical switches, that will likely become standard in the field of nano-mechanics.

Theme 3 has shown that the antenna-LED is the missing link of opto-electronic sources for on-chip optical communication. The antenna-LED operates at low power, but at a speed faster than lasers.

Theme 4 has shown the correct path for high-speed magnetic switching, increasing switching speed by 100×, down to the picosecond range.

