Quantum circuits for the CSIDH: optimizing quantum evaluation of isogenies Daniel J. Bernstein Tanja Lange Chloe Martindale Lorenz Panny quantum.isogeny.org

	pre-quantum	post-quantum
SIDH, SIKE	$(24 + o(1))\lambda$	$(36+o(1))\lambda$
compressed	$(14 + o(1))\lambda$	$(21+o(1))\lambda$
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Subexp 2010 Childs–Jao–Soukharev attack, using 2003 Kuperberg or 2004 Regev or 2011 Kuperberg.

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- What about memory, using parallel AT metric?

#### Case study: attacking CSIDH-512 CSIDH-512 query, uniform over $\{-5, \ldots, 5\}^{74}$ , failure chance $<2^{-32}$ (maybe ok), nonlinear bit ops: $\approx 2^{51}$ by 2018 Jao-LeGrow-Leonardi-Ruiz-Lopez.

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