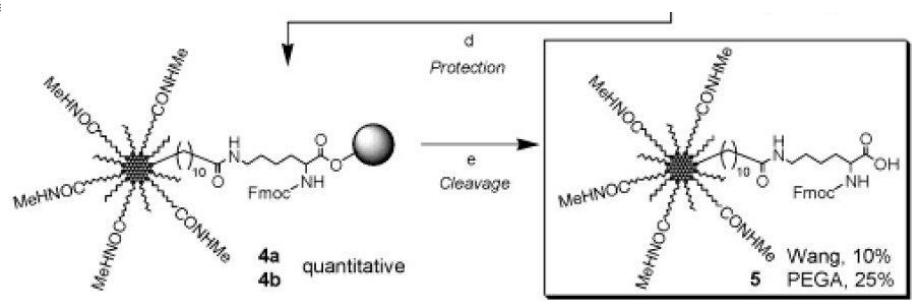
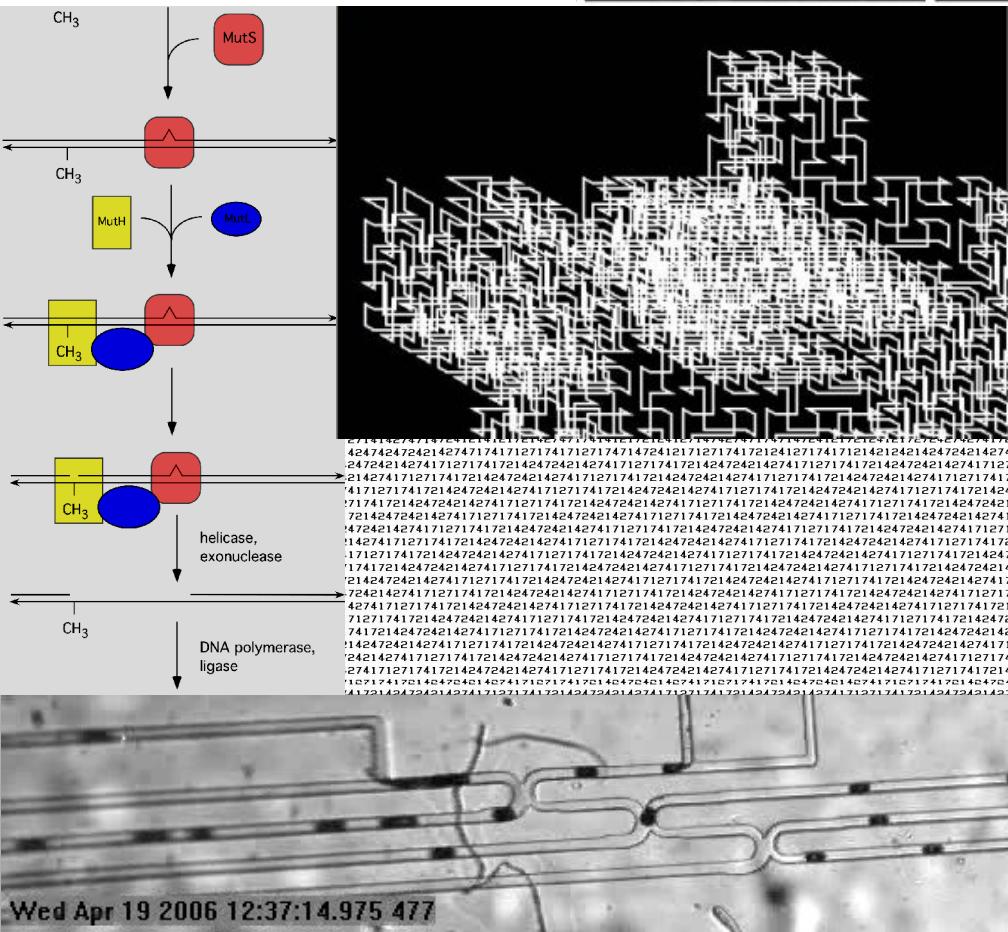
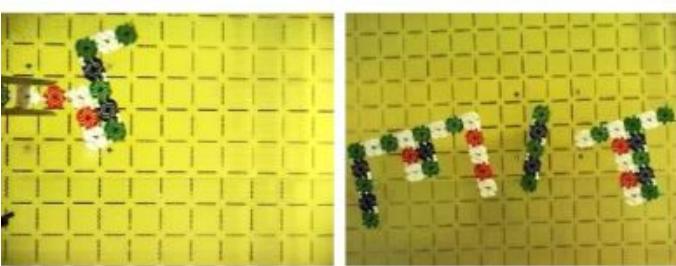


Digital Fabrication



Mathematical Programming

The collage includes the following elements:

- Top Left:** A logic circuit diagram showing multiple logic gates (AND, OR, NOT) and flip-flops connected to a breadboard.
- Top Center:** A screenshot of a digital oscilloscope interface showing waveforms for four channels (CH1-CH4) with parameters like AC 14.5 V, Coupling DC, and Mode Normal & Holdoff.
- Top Right:** A complex optical cavity diagram with many mirrors, beam splitters, and lenses. A zoomed-in inset shows a network of optical paths between mirrors.
- Middle Left:** A schematic diagram of an optical cavity setup. Light enters from the left through a prism, reflects off a high reflector, passes through a Ti:Sapphire crystal, and is directed by a TFP Beam Splitter to an output coupler and a beam dump.
- Middle Center:** A circuit board with a grid of red LEDs and associated electronic components. A US quarter coin is placed next to it for scale.
- Middle Right:** A mathematical equation: $L = U - H + \sum_i \sum_n \lambda_{in} \left(b_i(x_i) - \sum_{\vec{x}_n \setminus x_i} b_n(\vec{x}_n) \right)$.
- Bottom Left:** A quantum circuit diagram labeled 'a' showing a sequence of operations: Hadamard (H), controlled-NOT (CNOT), inverse Quantum Fourier Transform (Inverse QFT), and measurement. It also shows a second part 'b' with a sequence of operations involving Hadamard gates, temporal averaging, and measurements.
- Bottom Center:** A diagram of a quantum state preparation circuit. It shows a central node with three outgoing lines, each passing through a sequence of operations (represented by circles and squares). The equations $c_n = 1$ and $c_i = 1 - d_i = 1 - \gamma$ are shown near the nodes.
- Bottom Right:** A photograph of a large-scale optical experiment. A computer monitor displays the letter 'A', which is being projected or measured by a complex optical setup consisting of many lenses, mirrors, and beam splitters.

Coding and Computation in Microfluidics

9:00-10:30

1:30-3:00

Historical Perspective

Marvin Minsky (MIT)

Ron Stouffer, Sri Sridhara (Bowles Fluidics)

Bubbles in Mazes

George Whitesides (Harvard)

Reversibility of the flow of droplets in microfluidic networks

Piotr Garstecki (Polish Academy of Sciences)

SPICE'd Microfluidics

Olgierd Cybulski (Polish Academy of Sciences)

Microfluidic Bubble Logic

Manu Prakash (MIT)

11:00-12:30

Components for Generic and Programmable Microfluidic Devices

Will Grover (MIT)

Microfluidics for Gene Fabrication

Peter Carr, Dave Kong (MIT)

Opportunities in Microfluidics for Enabling Engineered Biological Simplicity

Drew Endy (MIT)

Integrating Optoelectronic, Fluidic & Biochemical Programming For Open-Source Personal Genomics & Synthetic Biology

George Church (Harvard)

Chaos in Droplet-Based Microfluidic Systems

Patrick Tabeling (Ecole Supérieure de Physique et de Chimie Industrielles)

Multiple Flow Problems In Fluid Mechanics With Emphasis On Climate Issues

Jack Whitehead (Woods Hole Oceanographic Institution)

The Phase Chip: Manipulating Phase Diagrams with Microfluidics

Seth Fraden (Brandeis)

Multiphase Microfluidics: Flows, Dispersion, and Nanomaterial Synthesis

Axel Guenther (University of Toronto)

Directed Fluidic Assembly

Hod Lipson (Cornell)

3:30-4:30 **Future Work**

implications

implementations

funding

facilities

collaborations

4:30 **Reception**

6:00 **South End Technology Center Fab Lab Open House**