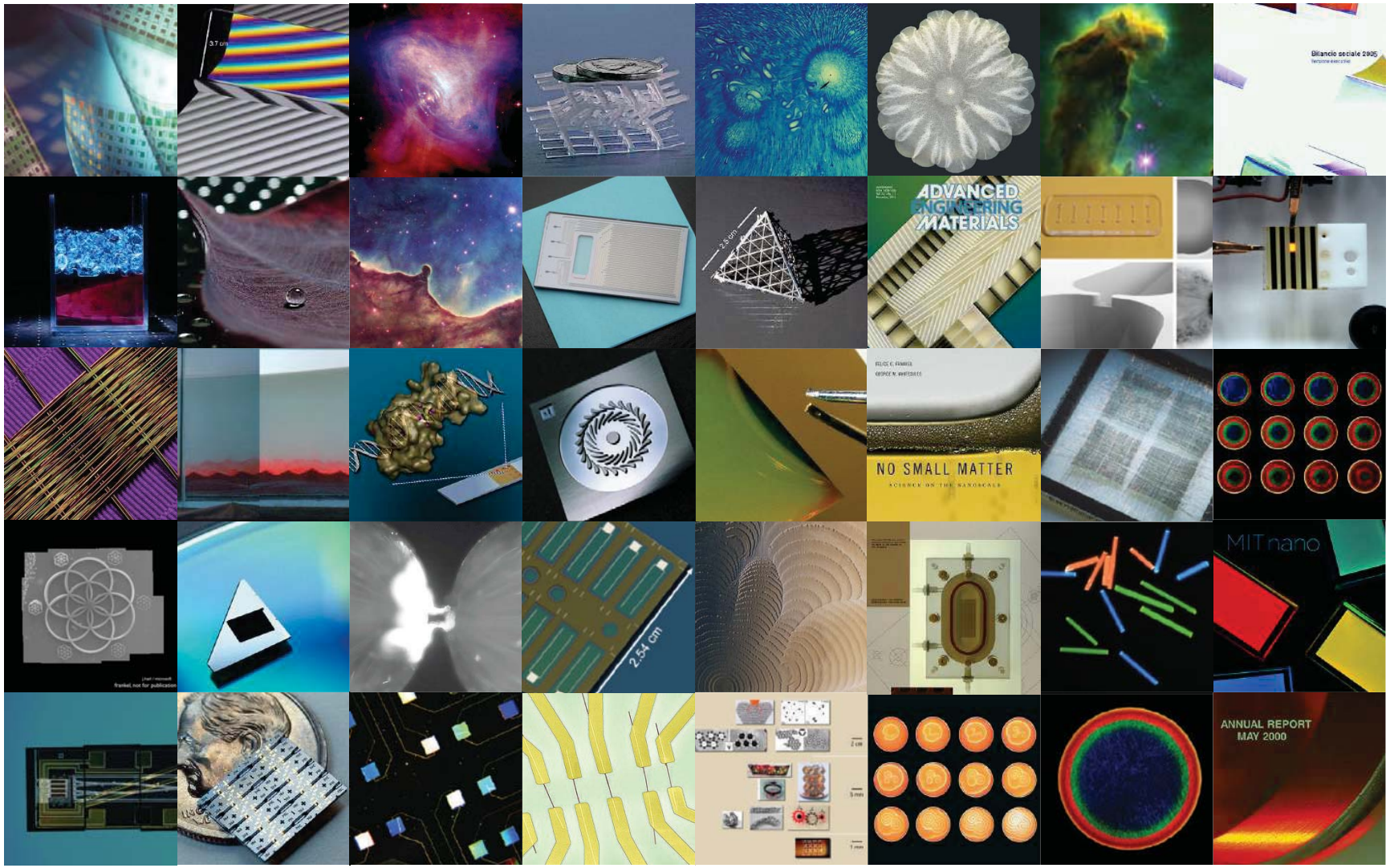
VISUAL INDEX
WEEK 5:
PRESENTING YOUR
WORK

MAKING SCIENCE AND ENGINEERING PICTURES

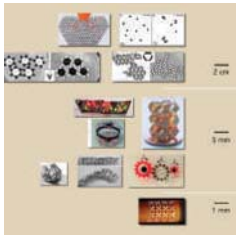
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



all images by Felice Frankel

VISUAL INDEX
WEEK 5:
PRESENTING YOUR WORK

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



self-assembled structures

Whitesides Lab
Department of Chemistry and Chemical Biology

Harvard University

unpublished

micro reactor

Jensen Lab

Massachusetts Institute of Technology

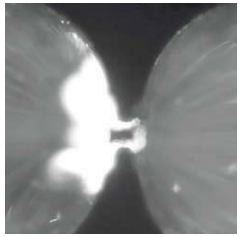
Losey, M.W., Schmidt, M.A., and Jensen, K.F. "Microfabricated multiphase packed-bed reactors: Characterization of mass transfer and reactions". *Industrial & Engineering Chemistry Research*, 40,(2001).

bacterial analysis

C. Buie Lab

Massachusetts Institute of Technology

Braff, W.A., Willner, D., Hugenholtz, P., "Dielectrophoresis-Based Discrimination of Bacteria at the Strain Level Based on Their Surface Properties." *PLOS ONE* (October, 2013).

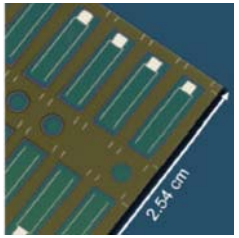


bacterial analysis

C. Buie Lab

Massachusetts Institute of Technology

Braff, W.A., Willner, D, Hugenholtz, P. "Dielectrophoresis-Based Discrimination of Bacteria at the Strain Level Based on Their Surface Properties." *PLOS ONE* (October, 2013).



solar cell

T. Buonassisi Lab
Photovoltaic Research Laboratory

Massachusetts Institute of Technology

Steinmann, V., Jaramillo, R., Hartman, K., et al. “3.88% Efficient Tin Sulfide Solar Cells Using Congruent Thermal Evaporation.” *Advanced Materials* 26, no. 44 (August 20, 2014).

Belousov-Zhabotinsky reaction

A. Zhabotinsky Laboratory

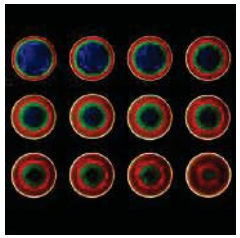
Brandeis University

Fife, P. C. “Understanding the Patterns in the BZ Reagent.” *Journal of Statistical Physics* 39, nos. 5–6 (June 1985).

all images by Felice Frankel

VISUAL INDEX
WEEK 5:
PRESENTING YOUR WORK

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



block copolmers time-lapse

Ned Thomas Lab

Massachusetts Institute of Technology

"Dynamic Changes in Structural Color of a Lamellar Block Copolymer Photonic Gel during Solvent Evaporation", Lee,W., Yoon, J.,Lee, H., *Macromolecules* 2013, 46

reversible collapse

A. Hosoi Lab

Massachusetts Institute of Technology

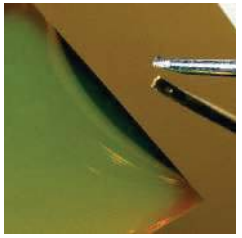
unpublished

integrated optical components

Alice White Laboratory

Bell Laboratories, Lucent Technologies

White, A. E. "Integrated Optical Components for WDM Systems." *Optics and Photonics News* 11, no. 3 (March 2000).

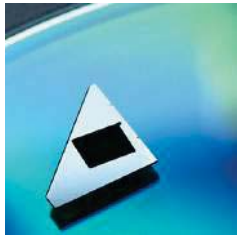


patterned drops of water

G. Whitesides, Department of Chemistry and Chemical Biology; Whitesides Research Group

Harvard University

Abbott, N.L., Folkers, J.P. and Whitesides, G.M. "Manipulation of the Wettability of Surfaces on the 0.1 to 1-Micrometer Scale through Micromachining and Molecular Self-Assembly." *Science* 257, no. 5075 (September 4, 1992).

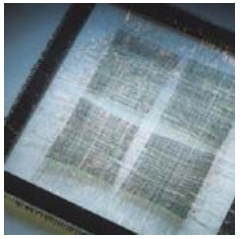


black silicon

E. Mazur, Mazur Group

Harvard University

Wu, C., C.H. Crouch, L. Zhao, et al. "Near-Unity Below-Band-Gap Absorption by Microstructured Silicon." *Applied Physics Letters* 78, no. 13 (March 26, 2001).



magnetic core memory

Frankel, F. *Envisioning Science: The Design and Craft of the Science Image*. Cambridge, MA: MIT Press, 2002.

all images by Felice Frankel

VISUAL INDEX
WEEK 5:
PRESENTING YOUR WORK

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK

morpho butterfly wing

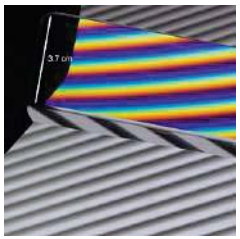
Frankel, F. *Envisioning Science: The Design and Craft of the Science Image*. Cambridge, MA: MIT Press, 2002.

3D-printed layered composites with varying microstructure parameters (cover)

Boyce Lab, Department of Mechanical Enginneering

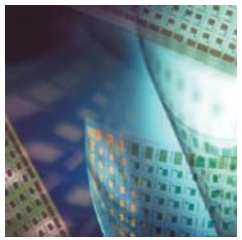
Massachusetts Institute of Technology

Rudykh, S. and Boyce, M.C. "Transforming Small Localized Loading into Large Rotational Motion in Soft Anisotropically Structured Materials." *Advanced Engineering Materials* Volume 16, Issue 11, (November 2014)



prism

Frankel, F., and Whitesides, G.M. *No Small Matter: Science on the Nanoscale*. Cambridge, MA: Belknap Press of Harvard University Press, 2009.



flexible electronic circuit

J. Rogers, Department of Materials Science and Engineering; Rogers Research Group

Previosuly for this research: Bell Labs. Presently: University of Illinois at Urbana-Champaign

Rogers, J.A., Z. Bao, K. Baldwin, et al. "Paper-Like Electronic Displays: Large-Area Rubber-Stamped Plastic Sheets of Electronics and Microencapsulated Electrophoretic Inks." *PNAS* Volume 19, no. 28 (April 24, 2001).

three-dimensional metallic tetrahedron microstructure

G. Whitesides, Department of Chemistry and Chemical Biology; Whitesides Research Group

Harvard University

Jackman, R.J., Brittain, S.T., and Adams, A. "Three-Dimensional Metallic Microstructures Fabricated by Soft Lithography and Microelectrodeposition." *Langmuir* 15, no. 3 (February 2, 1999).

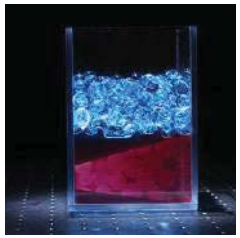
"lotus effect"

Chemistry and Chemical Reactivity, Feb 7, 2008
John C. Kotz and Paul M. Treichel Brooks Cole; 7 edition (February 7, 2008)

all images by Felice Frankel

VISUAL INDEX
WEEK 5:
PRESENTING YOUR WORK

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



refractive index changes

J. Dijksman, Physics Department

Duke University

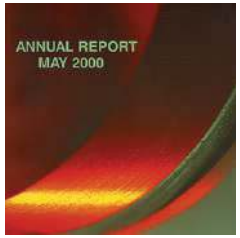
Dijksman, J.A., Rietz, F., Lőrincz, K.A., et al. "Invited Article: Refractive Index Matched Scanning of Dense Granular Materials." *Review of Scientific Instruments* 83, no. 1 (January 2012).

bioreactor

Linda Griffith Lab

DuPont MIT Alliance
Massachusetts Institute of Technology

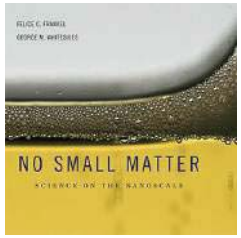
unpublished



instrument detail

Microsystems Technology Laboratories

Massachusetts Institute of Technology



beer (cover)

Frankel, F., and Whitesides, G.M. *No Small Matter: Science on the Nanoscale*. Cambridge, MA: Belknap Press of Harvard University Press, 2009.

sea urchin

DuPont MIT Alliance

Massachusetts Institute of Technology

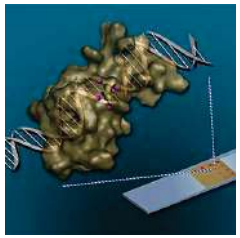
bubbles

Assolombarda

Polli, R., and Faliva, G. *Bilancio Sociale 2005*. Versione executive. Milan, Italy: Assolombarda, 2005.

all images by Felice Frankel

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



assay

H. Sikes Laboratory, Department of Chemical Engineering

Massachusetts Institute of Technology

Heimer, B.W., Shatova, T.A., and Lee, J.K. "Evaluating the Sensitivity of Hybridization-Based Epigenotyping Using a Methyl Binding Domain Protein." *Analyst* 139, no. 15 (August 7, 2014).

quantum dots

Moungi Bawendi Lab

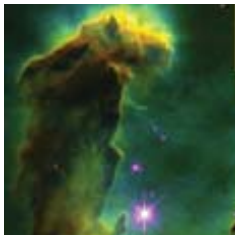
Massachusetts Institute of Technology

MIT PUBLICATION: MIT.nano, The Future of Innovation, 2014

Hubble images

NASA

http://www.stsci.edu/portal/http://hubblesite.org/gallery/album/



Gas Pillars in the Eagle Nebula (M16): Pillars of Creation in a Star-Forming Region

Jeff Hester, Paul Scowen

NASA

http://hubblesite.org/gallery/album/entire/pr1995044a/

Hubble images

NASA

http://www.stsci.edu/portal/http://hubblesite.org/gallery/album/

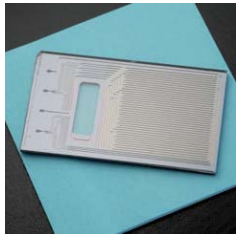
optical fibers

Y. Fink, Materials Science and Engineering Department; Research Laboratory of Electronics

Massachusetts Institute of Technology

VISUAL INDEX
WEEK 5:
PRESENTING YOUR WORK

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK

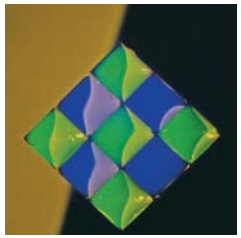


High pressure microreactor

K. Jensen, Jensen Research Group

Massachusetts Institute of Technology

Marre, S., Adamo,A., Basak, S., et al. "Design and Packaging of Microreactors for High Pressure and High Temperature Applications." *Industrial Engineering and Chemistry Research* 49, no. 22 (November 2010).

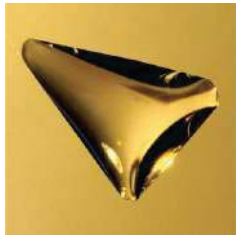


patterned drops of water

G. Whitesides, Department of Chemistry and Chemical Biology; Whitesides Research Group

Harvard University

Abbott, N.L., Folkers, J.P., and Whitesides, G.M. "Manipulation of the Wettability of Surfaces on the 0.1 to 1-Micrometer Scale through Micromachining and Molecular Self-Assembly." *Science* 257, no. 5075 (September 4, 1992).

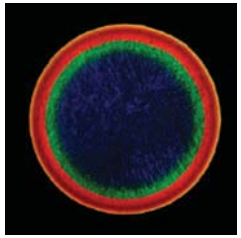


patterned drops of water

G. Whitesides, Department of Chemistry and Chemical Biology; Whitesides Research Group

Harvard University

Abbott, N.L., Folkers, J.P., and Whitesides, G.M. "Manipulation of the Wettability of Surfaces on the 0.1 to 1-Micrometer Scale through Micromachining and Molecular Self-Assembly." *Science* 257, no. 5075 (September 4, 1992).

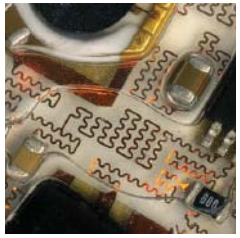


block copolymers

Ned Thomas Lab

Massachusetts Institute of Technology

"Dynamic Changes in Structural Color of a Lamellar Block Copolymer Photonic Gel during Solvent Evaporation", Lee,W., Yoon, J.,Lee, H., *Macromolecules* 2013, 46

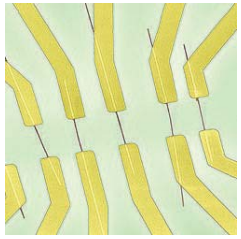


soft microfluidic sensor

J. Rogers, Department of Materials Science and Engineering; Rogers Research Group

University of Illinois at Urbana-Champaign

Xu, S., Zhang, Y., Jia, L., et al. "Soft Microfluidic Assemblies of Sensors, Circuits, and Radios for the Skin." *Science* 344, no. 6179 (April 4, 2014).



nanowires

Charles Lieber Lab

Harvard University

"The Incredible Shrinking Circuit", *Scientific American* 285 (2001).

all images by Felice Frankel

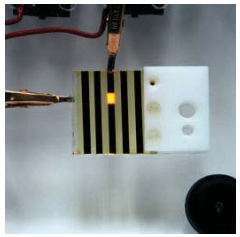
MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK

yeast colony

G. Fink, Whitehead Institute for Biomedical Research

Massachusetts Institute of Technology

Reynolds, T. B. and Fink, G.R. "Bakers' Yeast, a Model for Fungal Biofilm Formation." *Science* 291, no. 5505 (February 2, 2001).

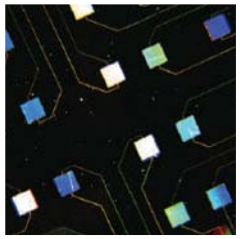


light-emitting device

M. Rubner, Department of Materials Science and Engineering

Massachusetts Institute of Technology

Handy, E.S., Pal, A.J., and Rubner, M.F. "Solid-State Light-Emitting Devices Based on the Tris-Chelated Ruthenium(II) Complex. 2. Tris(bipyridyl)ruthenium (II) as a High-Brightness Emitter." *Journal of the American Chemical Society* 121, no. 14 (April 14, 1999).



all-electronic DNA array sensor

D. Ehrlich and P. Matsudaira

Whitehead Institute for Biomedical Research

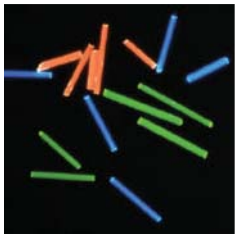
unpublished

microrotor blades

A. Epstein, Gas Turbine Laboratory, and M. Schmidt; Microsystems Technology Laboratories

Massachusetts Institute of Technology

Gabriel, K.J. "Engineering Microscopic Machines." *Scientific American* 273, no. 3 (September 1995).



acrylamide monomers

Toyoichi Tanaka's Lab

Massachusetts Institute of Technology

Oya, T. et al., "Reversible Molecular Adsorption Based on Multiple-Point Interaction by Shrinkable Gels," *Science* 286 (1999).

proteus colonies

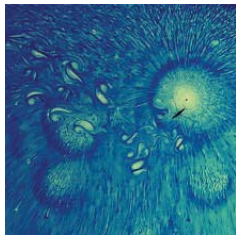
James Shapiro's Lab

University of Chicago

Shapiro, J.A. et al., "Sequential Events in Bacterial Colony Morphogenesis," *Physica D* 49 (1991).

all images by Felice Frankel

MAKING SCIENCE AND ENGINEERING PICTURES
A PRACTICAL GUIDE TO PRESENTING YOUR WORK



vortices left by strider

John Bush Lab

Massachusetts Institute of Technology

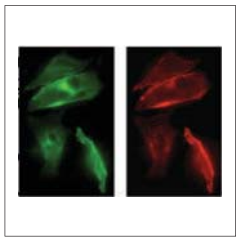
Frankel, F., "Walk on Water." *American Scientist*, 92 (July-August 2004).

ocean wave analysis

Department of Civil and Environmental Engineering

Massachusetts Institute of Technology

Landry, B., Hancock, M., et al., "Note on sediment sorting in a sandy bed under standing water waves", *Coastal Engineering* 54 (2007).

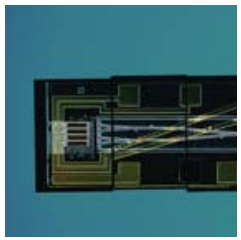


quantum dots

Original images by P. Zou and A. Ting

Massachusetts Institute of Technology

Howarth, M., et al., "Monovalent Reduced-size Quantum Dots for Imaging Receptors on Living Cells, *Nature Methods* 5 (2008).

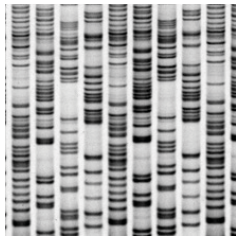


silicon optical bench submount

Alice White Lab, Bell Laboratories

Lucent Technologies

Gates, J., Muehlner, D. et al., "Hybrid Integrated Silicon Optical Bench Planar Lightguide Circuits", *Proceedings of the 48th Electronic Comp. and Tech. Conf.*, Seattle, Washington, S15P1, (1998).



DNA analysis

Phillip A. Sharp Lab

Massachusetts Institute of Technology

Zhou, Q.A., Sharp, P.A., "Tat-SF1: Cofactor for stimulation of transcriptional elongation by HIV-1 Tat." *SCIENCE* 274 (Oct 25 1996).

aligned carbon nanotubes

SEMs and research by John Hart

Massachusetts Institute of Technology

"Needlework", Frankel, F. *American Scientist*, 94, (2006).

all images by Felice Frankel

Resource: Making Science and Engineering Pictures: A Practical Guide to Presenting Your Work

Felice Frankel