take its place. If we do not take time to openly reflect on our individual and collective experiences as Patterson and Mehta have, then we risk becoming elitists who repeat the mistakes of those who still look down on interdisciplinary physics.

The introduction to the American Institute of Physics 2013 annual report focused primarily on administrative matters, but one passage seems particularly relevant here: "By embracing change, we are open to learning more and are able to adapt more quickly to changing needs. By driving change, we can strategically apply our resources to address specific problems or chart new directions." My hope is that someday, when my generation is older, grayer, and discussing science with our juniors, we will remember those words and embrace the inevitable changes that come with time.

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Letters

Ultrafast camera's early history

For the record, scientists at Los Alamos National Laboratory developed systems that use a streak tube and image compression to record ultrafast two-dimensional movies of transient events some 30 years ago[1,2] (PHYSICS TODAY, February 2015, page 12). A cylindrical lens focuses the light from a 2D scene into a 1D line, which is actually a tomographic projection integral containing unfiltered information from the entire image. Four such time-dependent projections of a rapidly evolving scene, one every 45 degrees, were fed into coherent fiber-optic ribbons and sent some 25 m to the photocathode of a streak tube. The fiber-optic ribbons, filtered by both wavelength and mode, achieved subnanosecond time resolution. A digital video system recorded the resulting spacetime streak-tube image, with each scan line containing a time sample of the four projections.

In the data analysis, a modified version of G. Minerbo's maximum entropy tomography algorithm[3,4] was used to reconstruct a frame of the output movie from each scan line of the streak-tube image. A later variant of the algorithm produced a 3D spacetime tomographic reconstruction using a time-integrated 2D image of the same scene, exposed for the duration of the streak-tube sweep, as a tomographic projection along the time axis. The reconstructed movie solution is then constrained to add up to the time exposure.

More recently, workers at the Dual Axis Radiographic Hydrodynamic Test Facility at Los Alamos successfully used several streak-tomography systems as near-real-time beam diagnostics in the commissioning of the facility's high-current pulsed electron accelerator.[5]

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A final note on bell-like tones

Because I am a little unclear on some of the physics involved, I have been hesitant to speak on the issue of bell-like sounds from a piano. However, the letter from Myron Levitsky (PHYSICS TODAY, March 2015, page 9) has motivated me to comment.

Although the Saint-Saëns piano concerto Levitsky discusses is beautiful, I believe that its octaves and thirds are more characteristic harmonics of organ pipes or bowed strings than of bells. The distinctive sound of bells comes from their complex, nonlinear harmonic series that typically contains dissonant tones relatively low in the series.

By far the best piano bell simulation I've heard comes in a hauntingly beautiful section of "Copacabana," the fourth dance in Darius Milhaud's Saudades do Brasil, which I believe is intended to evoke the sweet sound of distant bells. Hear a brief audio file of the section at http://rtcutler.com/Audio/MilhaudBells.mp3, and see a sample of the score below. The work is basically in C major, but I call your attention to the dissonant notes—for example, F#, C#, and D#—that give it the bell-like sound.

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Correction

May 2015, page 36—The equation relating luminosity and effective temperature should be $L = 4\pi\sigma R^2 T_{\text{eff}}^4$. ■