EDITED BY GILBERT CHIN AND MARIA CRUZ

ENVIRONMENTAL SCIENCE

Governance by the People

Real-world challenges in how to manage public resources have frequently been met by bottom-up collective action. One area in which researchers have yet to reach consensus is the relation of group size to collective action and resource outcomes. Yang *et al.* use data gathered over many years from the Wolong Nature Reserve in Sichuan Province, China. Within the reserve, the administrative bureau of the National Forest Conservation Program had assigned forest parcels to groups composed of 1 to 16 households. Each group decided on a strategy for monitoring illegal activity, such as logging, and the bureau conducted assessments of how much activity had occurred. Group size had a U-shaped relation to the monitoring efforts per household and on increasing forest cover. Intermediate group sizes of 8 or 9 households were optimal in balancing between two opposing factors: free-riding (the tendency to let others in the group do the work) and within-group enforcement. These findings, as well as the demonstration that stronger social relationships within the groups and with local leaders promoted collective action, suggest strategies for effective governance. — BJ

Proc. Natl. Acad. Sci. U.S.A. **110**, 10.1073/pnas.1301733110 (2013).

VIROLOGY

Location, Location, Location

The ability of HIV to reside in a latent form in T cells is a major hurdle to finding a cure. With no widely protective vaccine on the horizon, there is growing interest in understanding how to convert latent HIV into a replication active state, which would allow therapies that target infected cells to eliminate them. Mechanisms that contribute to HIV latency, however, are poorly understood. Using a combination of immuno-3D fluorescent in situ hybridization and chromatin immunoprecipitation, Lusic *et al*. find that location matters for latency. In T cell lines and in a model of primary T cells chronically infected with HIV, silenced but not active provirus was located close to nuclear bodies, as measured by their association with promyelocytic leukemia protein (PML), a marker of these structures. The blockade or silencing of PML led to the activation of viral transcription. This was associated with a loss of binding to the methyltransferase G9a and a loss of epigenetic silencing marks from the proviral DNA. Actin-mediated movement away from nuclear bodies was required for transcriptional activation of the virus. Whether modulation of these pathways may be used therapeutically to reactivate and eradicate infected cells remains to be determined. — KLM

Cell Host Microbe **13**, 665 (2013).

EDUCATION

Interdisciplinary Check

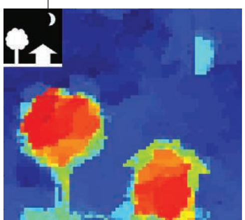
Interdisciplinarity has been increasingly called for in U.S. science education, but it is not always clear how to best integrate it into the curricula. Gouvea *et al.* considered the learning objectives of interdisciplinary science courses and created a framework intended to aid in redesigning tasks to better align with these learning objectives. They tested the framework in an introductory physics course that connected with both biology and chemistry. Tasks were divided into those with an imbalance in the interaction between the disciplines, those applying a reasoning strategy or technique from one discipline to another, and those bringing ideas from two separate disciplines together. Using a theoretical analysis of interaction between disciplines, the authors asked a series of questions about the degree to which each of the disciplines was represented in the tasks included in their curriculum, in addition to examining students' written performance on homework and exams and analyzing videos and transcripts of students' reasoning in group problem-solving settings. The results showed that the value of the framework lay not in its ability to characterize tasks in an interdisciplinary context, but rather in its being a tool that can help guide interdisciplinary task creation and revision. — MM

CBE Life Sci. Educ. **12**, 187 (2013).

APPLIED PHYSICS

Compressively Sensing Ghosts

The storing and processing of images can place large overheads on the hardware and software required to identify targets within each frame. Compressive sensing exploits the fact that much of an image is redundant, or sparse, in terms of the information it contains. Specially designed lenses and filters can sift through the large pile of data and automatically pick out the targets of interest, thereby reducing the computational overheads. Magaña-Loaiza *et al.* combined compressive sensing with ideas in ghost imaging, a technique in which the correlations between quantum-mechanically entangled photons can be used to build up an image of an object with photons that have not interacted with the object directly. The authors demonstrate that such a combination of advanced imaging techniques can be used to track a moving target, requiring many fewer measurements to do so, and describe how such a resource-efficient strategy is applicable to real-world applications of stealth imaging of moving targets. — ISO



Appl. Phys. Lett. **102**, 231104 (2013).

Published by AAAS