Crystallography at 100

INTRODUCTION
1091   Going from Strength to Strength

NEWS
1092   Dazzling History
>> Science Podcast
1094   Gently Does It

REVIEWS
1098   Cutting-Edge Techniques Used for the Structural Investigation of Single Crystals
J. A. K. Howard and M. R. Probert

EDITORIAL
1057   Crystallography and Geopolitics
Gautam R. Desiraju
>> Crystallography at 100 section p. 1091

NEWS OF THE WEEK
1062   A roundup of the week’s top stories

NEWS & ANALYSIS
1065   Sabotaged Scientist Sues Yale and Her Lab Chief
1067   A Bid to Thwart HIV With Shot of Long-Lasting Drug
>> Report p. 1151
1068   Diet Studies Challenge Thinking on Proteins Versus Carbs
1069   Major Conservation Group Guts Science Team in Strategy Shift
1070   Chemical Atlas Shows Where Seas Are Tainted—and Where They Can Bloom
1071   Europe’s Copernicus Offers a Daily Dose of Earth Data

NEWS FOCUS
1072   Structural Biology Scales Down
>> Crystallography at 100 section p. 1091

LETTERS
1076   Small Telescopes, Big Rewards
W. B. Weaver
A Safety Net for Diabetics
J. C. Javitt
Supporting Mavericks
P. Andrews

CORRECTIONS AND CLARIFICATIONS
1077   Feedback of the Magnetosphere
J. E. Borovsky
>> Report p. 1122

BOOKS ET AL.
1078   The Social Lives of Forests
S. B. Hecht et al., Eds., reviewed by T. Plieninger
1079   The Dynamics of Disaster
S. W. Kieffer, reviewed by D. Turcotte

POLICY FORUM
1080   Why Should We Care About Temporary Waterways?
V. Acuña et al.

PERSPECTIVES
1082   The Secret Garden—Epigenetic Alleles Underlie Complex Traits
R. J. Schmitz
>> Report p. 1145
1083   CO Meets CO, One at a Time
M. Salmeron
>> Report p. 1120
1084   Water Loss from the Great Lakes
A. D. Gronewold and C. A. Stow

ON THE WEB THIS WEEK
>> Science Podcast
Listen to stories on 100 years of crystallography, firming up the link between climate change and malaria, and more.

>> Find More Online
Check out Science Express, the weekly podcast, videos, daily news, our research journals, and Science Careers at www.sciencemag.org.

COVER
Precession image reconstructed from x-ray diffraction data collected from a benzene single crystal. For the past 100 years, x-ray crystallography has been a key tool for determining the structures of ever more complex chemical and biochemical systems. See the special section beginning on page 1091 and at www.sciencemag.org/special/crystallography.

Image: Judith A. K. Howard and Michael R. Probert

DEPARTMENTS
1055   This Week in Science
1058   Editors’ Choice
1060   Science Staff
1159   New Products
1160   Science Careers
RESEARCH ARTICLES

1117 Dynamic Reorganization of River Basins
S. D. Willett et al.
A proxy for river elevation demonstrates the degree to which river networks reorganize and equilibrate.
Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1248765

1118 Innate Immune Activity Conditions the Effect of Regulatory Variants upon Monocyte Gene Expression
B. P. Fairfax et al.
Analysis of the transcriptional responses during induced innate immune activity in primary human monocytes is explained.
Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1246949

1119 Common Genetic Variants Modulate Pathogen-Sensing Responses in Human Dendritic Cells
M. N. Lee et al.
Mapping of human host-pathogen gene–environment interactions identifies pathogen-specific loci.
Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1246980

REPORTS

1120 Quantifying Molecular Stiffness and Interaction with Lateral Force Microscopy
A. J. Weymouth et al.
Lateral force microscopy reveals the torsional spring constant of a carbon monoxide molecule at the end of an atomic force microscope tip.
>> Perspective p. 1083

1122 Simultaneous Ground- and Space-Based Observations of the Plasmaspheric Plume and Reconnection
B. M. Walsh et al.
Ground-based and satellite observations show that a plume extends all the way to the magnetopause and can persist for hours.
>> Perspective p. 1086

1125 Tunable Phonon Polaritons in Atomically Thin van der Waals Crystals of Boron Nitride
S. Dai et al.
Infrared nanoimaging is used to detect a type of surface collective mode in a representative van der Waals crystal.

1129 Rapid Reductions in North Atlantic Deep Water During the Peak of the Last Interglacial Period
E. V. Galasen et al.
Deep ocean circulation was less stable during the last interglacial periods than previously supposed.

1133 Structural Basis for Heavy Metal Detoxification by an Atm1-Type ABC Exporter
J. Y. Lee et al.
Structural and functional studies of ABC exporters provide insight into how glutathione derivatives are translocated.
>> Crystallography at 100 section p. 1091

1137 Crystal Structures of Nucleotide-Free and Glutathione-Bound Mitochondrial ABC Transporter Atm1
V. Srinivasan et al.
Crystallography and spectroscopy detail a key mechanistic step in the microbial biosynthesis of an important antibiotic class.
>> Crystallography at 100 section p. 1091

1140 Mechanism of the C5 Stereoinversion Reaction in the Biosynthesis of Carbapenem Antibiotics
W.-C. Chang et al.
Crystallography and spectroscopy detail a key mechanistic step in the microbial biosynthesis of an important antibiotic class.
>> Crystallography at 100 section p. 1091

1145 Mapping the Epigenetic Basis of Complex Traits
S. Cortijo et al.
Genetic mapping reveals epigenetic changes associated with flowering time and root length.
>> Perspective p. 1082

1148 A Single Gene Affects Both Ecological Divergence and Mate Choice in Drosophila
H. Chung et al.
A methyl-branched cuticular hydrocarbon affects both desiccation resistance and mate choice in related Drosophila species.
>> News story p. 1067

1151 Long-Acting Integrase Inhibitor Protects Macaques from Intrarectal Simian/Human Immunodeficiency Virus
C. D. Andrews et al.
Prolonged protection from repeated SHIV challenges is demonstrated in macaques.

1154 Altitudinal Changes in Malaria Incidence in Highlands of Ethiopia and Colombia
A. S. Siraj et al.
Warmer years promote malaria cases at higher altitudes.
>> Science Podcast
Science 343 (6175), 1055-1159.