

**COVER IMAGE**

Random lasers generate the optical feedback required for stimulated emission by scattering light from disordered particles. Their inherent randomness, however, makes controlling the emission wavelength difficult. It is now shown that this problem can be remedied by carefully matching the pump laser to the specific random medium. The concept is applied to a one-dimensional optofluidic device, but could also be applicable to other random lasers.

Letter p426; News & Views p412

IMAGE: PATRICK SEBBAH AND  
XAVIER NOBLIN, CNRS

COVER DESIGN: ALLEN BEATTIE

**ON THE COVER****Galaxy evolution**

Active galactic nuclei of distinction  
Letter p417; News & Views p414

**Szilard engine**

Entropy change detected in  
symmetry breaking  
Article p457; News & Views p409

**Graphene on hBN**

Commensurate stacking creates  
soliton-like structures  
Article p451

**EDITORIAL**

- 401 Wealth for toil  
401 Open for business?

**COMMENTARY**

- 402 Two steps forward, one step back  
Nathaniel Lasry, Jonathan Guillemette and Eric Mazur

**THESIS**

- 404 Does not compute?  
Mark Buchanan

**BOOKS & ARTS**

- 405 Faraday, Maxwell, and the Electromagnetic Field:  
How Two Men Revolutionized Physics  
*by Nancy Forbes and Basil Mahon*  
Reviewed by May Chiao
- 406 Film: Transcendence  
Reviewed by Luke Fleet

**RESEARCH HIGHLIGHTS**

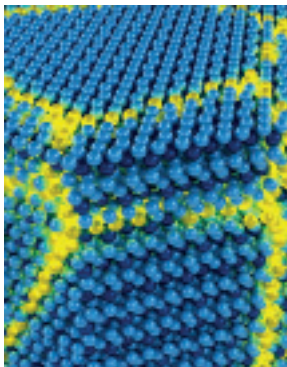
- 408 Our choice from the recent literature

**NEWS & VIEWS**

- 409 Thermodynamics: Engines and demons  
Jörn Dunkel
- 410 Friction: Let it slip  
Robert W. Carpick and Roland Bennewitz
- 412 Random lasers: Playing pinball with light  
Stefan Rotter
- 413 DNA self-assembly: Effective by design  
Abigail Klopfer
- 414 Astronomy: Unifying active galactic nuclei  
Martin Gaskell
- 415 Networks: Improve your virality  
Luke Fleet

**LETTERS**

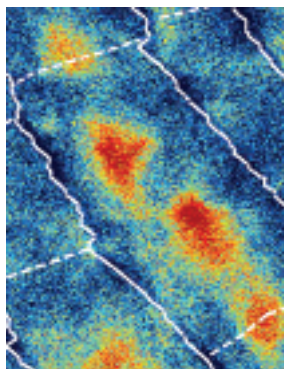
- 417 The different neighbours around Type-1 and Type-2 active  
galactic nuclei  
Beatriz Villarroel and Andreas J. Korn  
→N&V p414
- 421 Emergence of charge density wave domain walls above the  
superconducting dome in 1T-TiSe<sub>2</sub>  
Y. I. Joe, X. M. Chen, P. Ghaemi, K. D. Finkelstein, G. A. de la Peña,  
Y. Gan, J. C. T. Lee, S. Yuan, J. Geck, G. J. MacDougall, T. C. Chiang,  
S. L. Cooper, E. Fradkin and P. Abbamonte



When the charge density wave state in  $\text{TiSe}_2$  is suppressed by hydrostatic pressure or chemical doping, superconductivity appears.

This suggests the presence of a quantum critical point. Yet a high-pressure X-ray study unexpectedly finds that the quantum critical point is nowhere near the superconducting dome.

Letter p421



The effect of structural disorder on superconductivity can be subtle: for two crystalline arrangements of superconducting lead monolayers deposited on silicon, there are unexpected spatial variations that result in macroscopically different behaviour.

Article p444

- 426 Adaptive pumping for spectral control of random lasers**  
Nicolas Bachelard, Sylvain Gigan, Xavier Noblin and Patrick Sebbah  
→N&V p412
- 432 Terahertz control of nanotip photoemission**  
L. Wimmer, G. Herink, D. R. Solli, S. V. Yalunin, K. E. Echternkamp and C. Ropers

## ARTICLES

- 437 Two-stage magnetic-field-tuned superconductor–insulator transition in underdoped  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$**   
Xiaoyan Shi, Ping V. Lin, T. Sasagawa, V. Dobrosavljević and Dragana Popović
- 444 Remarkable effects of disorder on superconductivity of single atomic layers of lead on silicon**  
C. Brun, T. Cren, V. Cherkez, F. Debontridder, S. Pons, D. Fokin, M. C. Tringides, S. Bozhko, L. B. Ioffe, B. L. Altshuler and D. Roditchev
- 451 Commensurate–incommensurate transition in graphene on hexagonal boron nitride**  
C. R. Woods, L. Britnell, A. Eckmann, R. S. Ma, J. C. Lu, H. M. Guo, X. Lin, G. L. Yu, Y. Cao, R. V. Gorbachev, A. V. Kretinin, J. Park, L. A. Ponomarenko, M. I. Katsnelson, Yu. N. Gornostyrev, K. Watanabe, T. Taniguchi, C. Casiraghi, H.-J. Gao, A. K. Geim and K. S. Novoselov
- 457 Universal features in the energetics of symmetry breaking**  
É. Roldán, I. A. Martínez, J. M. R. Parrondo and D. Petrov  
→N&V p409

## FUTURES

- 462 Make-believe**  
Afalstein J. D. Kloosterman



nature publishing group

*Nature Physics* (ISSN 1745-2473, USPS 023176) is published monthly by Nature Publishing Group, a division of Macmillan Publishers Ltd, The Macmillan Building, 4 Crinan Street, London N1 9XW, UK. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form (electronic or otherwise) without prior permission from [permissions@nature.com](mailto:permissions@nature.com). US Periodicals postage paid at Jamaica, NY, and additional mailing post offices. US POSTMASTER: Send address changes to Nature Publishing Group, Air Business Ltd, c/o Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA. © 2014 Macmillan Publishers Limited. All rights reserved. Printed in United Kingdom.