

# Ting Zhu

## List of Publications by Year in descending order

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126  
papers

19,580  
citations

19608

61  
h-index

17546

121  
g-index

134  
all docs

134  
docs citations

134  
times ranked

16018  
citing authors

| #  | ARTICLE  | IF   | CITATIONS |
|----|--|------|-----------|
| 1  | Modeling Dislocation-Mediated Hydrogen Transport and Trapping in Face-Centered Cubic Metals. <i>Journal of Engineering Materials and Technology, Transactions of the ASME</i> , 2022, 144, . | 0.8  | 5         |
| 2  | In situ Observation of Li Deposition-Induced Cracking in Garnet Solid Electrolytes. <i>Energy and Environmental Materials</i> , 2022, 5, 524-532.  | 7.3  | 36        |
| 3  | Multiscale Concurrent Atomistic-Continuum (CAC) modeling of multicomponent alloys. <i>Computational Materials Science</i> , 2022, 201, 110873.   | 1.4  | 6         |
| 4  | Understanding and quantifying electron beam effects during in situ TEM nanomechanical tensile testing on metal thin films. <i>Acta Materialia</i> , 2022, 222, 117441.                       | 3.8  | 11        |
| 5  | Abnormal grain growth in ultrafine grained Ni under high-cycle loading. <i>Scripta Materialia</i> , 2022, 209, 114372.   | 2.6  | 9         |
| 6  | Unraveling the origin of extra strengthening in gradient nanotwinned metals. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2022, 119, .           | 3.3  | 36        |
| 7  | Learning constitutive relations of plasticity using neural networks and full-field data. <i>Extreme Mechanics Letters</i> , 2022, 52, 101645.  | 2.0  | 2         |
| 8  | Tracking the sliding of grain boundaries at the atomic scale. <i>Science</i> , 2022, 375, 1261-1265.   | 6.0  | 115       |
| 9  | Tuning the near room temperature oxidation behavior of high-entropy alloy nanoparticles. <i>Nano Research</i> , 2022, 15, 3569-3574.   | 5.8  | 6         |
| 10 | In situ atomic-scale observation of dislocation climb and grain boundary evolution in nanostructured metal. <i>Nature Communications</i> , 2022, 13, .                                       | 5.8  | 22        |
| 11 | Atomistic modeling of surface and grain boundary dislocation nucleation in FCC metals. <i>Acta Materialia</i> , 2022, 237, 118155.   | 3.8  | 13        |
| 12 | Understanding all solid-state lithium batteries through in situ transmission electron microscopy. <i>Materials Today</i> , 2021, 42, 137-161.  | 8.3  | 64        |
| 13 | Electro-chemo-mechanics of lithium in solid state lithium metal batteries. <i>Energy and Environmental Science</i> , 2021, 14, 602-642.  | 15.6 | 95        |
| 14 | Deformation-induced crystalline-to-amorphous phase transformation in a CrMnFeCoNi high-entropy alloy. <i>Science Advances</i> , 2021, 7, .   | 4.7  | 89        |
| 15 | Grain growth of nanocrystalline aluminum under tensile deformation: A combined in situ TEM and atomistic study. <i>Materialia</i> , 2021, 16, 101068.  | 1.3  | 10        |
| 16 | Unraveling dual phase transformations in a CrCoNi medium-entropy alloy. <i>Acta Materialia</i> , 2021, 215, 117112.  | 3.8  | 43        |
| 17 | In situ observation of cracking and self-healing of solid electrolyte interphases during lithium deposition. <i>Science Bulletin</i> , 2021, 66, 1754-1763.                                  | 4.3  | 16        |
| 18 | Degradation by Kinking in Layered Cathode Materials. <i>ACS Energy Letters</i> , 2021, 6, 3960-3969.   | 8.8  | 33        |

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|----|---|------|-----------|
| 19 | Strain gradient plasticity modeling of nanoindentation of additively manufactured stainless steel. <i>Extreme Mechanics Letters</i> , 2021, 49, 101503.   | 2.0  | 2         |
| 20 | Lithium whisker growth and stress generation in an in situ atomic force microscopeâ€“environmental transmission electron microscope set-up. <i>Nature Nanotechnology</i> , 2020, 15, 94-98.   | 15.6 | 217       |
| 21 | Temperature and composition dependent screw dislocation mobility in austenitic stainless steels from large-scale molecular dynamics. <i>Npj Computational Materials</i> , 2020, 6, .  | 3.5  | 23        |
| 22 | Free-Standing Two-Dimensional Gold Membranes Produced by Extreme Mechanical Thinning. <i>ACS Nano</i> , 2020, 14, 17091-17099.  | 7.3  | 15        |
| 23 | Anti-twinning in nanoscale tungsten. <i>Science Advances</i> , 2020, 6, eaay2792.   | 4.7  | 49        |
| 24 | Lattice strains and diffraction elastic constants of cubic polycrystals. <i>Journal of the Mechanics and Physics of Solids</i> , 2020, 138, 103899.   | 2.3  | 16        |
| 25 | <i>In situ</i> TEM measurement of activation volume in ultrafine grained gold. <i>Nanoscale</i> , 2020, 12, 7146-7158.  | 2.8  | 11        |
| 26 | <i>In Situ</i> Observation of Sodium Dendrite Growth and Concurrent Mechanical Property Measurements Using an Environmental Transmission Electron Microscopyâ€“Atomic Force Microscopy (ETEM-AFM) Platform. <i>ACS Energy Letters</i> , 2020, 5, 2546-2559. | 8.8  | 35        |
| 27 | Strain gradient plasticity in gradient structured metals. <i>Journal of the Mechanics and Physics of Solids</i> , 2020, 140, 103946.  | 2.3  | 41        |
| 28 | Nanomechanics of Materials: Overview. , 2020, , 1815-1826.  |      | 0         |
| 29 | Kinetics of environmentally assisted cracking in SiNx barrier films. <i>Applied Physics Letters</i> , 2019, 115, 051901.  | 1.5  | 4         |
| 30 | In Situ Nano-thermomechanical Experiment Reveals Brittle to Ductile Transition in Silicon Nanowires. <i>Nano Letters</i> , 2019, 19, 5327-5334.   | 4.5  | 34        |
| 31 | Microscale residual stresses in additively manufactured stainless steel. <i>Nature Communications</i> , 2019, 10, 4338.   | 5.8  | 120       |
| 32 | Nanomechanics of Materials: Overview. , 2019, , 1-12.   |      | 0         |
| 33 | Challenges and opportunities in chemomechanics of materials: A perspective. <i>Science China Technological Sciences</i> , 2019, 62, 1385-1387.  | 2.0  | 8         |
| 34 | Real-time nanoscale observation of deformation mechanisms in CrCoNi-based medium- to high-entropy alloys at cryogenic temperatures. <i>Materials Today</i> , 2019, 25, 21-27.   | 8.3  | 167       |
| 35 | Integrating in situ TEM experiments and atomistic simulations for defect mechanics. <i>Current Opinion in Solid State and Materials Science</i> , 2019, 23, 117-128.  | 5.6  | 16        |
| 36 | Atomistic modeling of dislocation cross-slip in nickel using free-end nudged elastic band method. <i>Acta Materialia</i> , 2019, 168, 436-447.  | 3.8  | 36        |

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|----|---|------|-----------|
| 37 | Tuning element distribution, structure and properties by composition in high-entropy alloys. <i>Nature</i> , 2019, 574, 223-227.  | 13.7 | 874       |
| 38 | Harnessing the concurrent reaction dynamics in active Si and Ge to achieve high performance lithium-ion batteries. <i>Energy and Environmental Science</i> , 2018, 11, 669-681.                               | 15.6 | 329       |
| 39 | Unraveling submicron-scale mechanical heterogeneity by three-dimensional X-ray microdiffraction. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2018, 115, 483-488. | 3.3  | 52        |
| 40 | Influence of Polymer Substrate Damage on the Time Dependent Cracking of SiN <sub>x</sub> Barrier Films. <i>Scientific Reports</i> , 2018, 8, 4560.  | 1.6  | 10        |
| 41 | Additively manufactured hierarchical stainless steels with high strength and ductility. <i>Nature Materials</i> , 2018, 17, 63-71.  | 13.3 | 1,517     |
| 42 | Mechanistic Origin of the High Performance of Yolk@Shell Bi <sub>2</sub> S <sub>3</sub> @N-Doped Carbon Nanowire Electrodes. <i>ACS Nano</i> , 2018, 12, 12597-12611.   | 7.3  | 213       |
| 43 | Mechanisms of Transformation of Bulk Aluminum-Lithium Alloys to Aluminum Metal-Organic Nanowires. <i>Journal of the American Chemical Society</i> , 2018, 140, 12493-12500.                                   | 6.6  | 15        |
| 44 | In situ full-field measurement of surface oxidation on Ni-based alloy using high temperature scanning probe microscopy. <i>Scientific Reports</i> , 2018, 8, 6684.  | 1.6  | 6         |
| 45 | Controlling Surface Oxides in Si/C Nanocomposite Anodes for High-Performance Li-Ion Batteries. <i>Advanced Energy Materials</i> , 2018, 8, 1801718.   | 10.2 | 190       |
| 46 | Avoiding Fracture in a Conversion Battery Material through Reaction with Larger Ions. <i>Joule</i> , 2018, 2, 1783-1799.  | 11.7 | 65        |
| 47 | Electrochemomechanical degradation of high-capacity battery electrode materials. <i>Progress in Materials Science</i> , 2017, 89, 479-521.  | 16.0 | 144       |
| 48 | Towards strength-ductility synergy through the design of heterogeneous nanostructures in metals. <i>Materials Today</i> , 2017, 20, 323-331.  | 8.3  | 687       |
| 49 | In situ S/TEM Observation of Hydrogen Bubbles Formation and Evolution in Aluminium Nanoparticles. <i>Microscopy and Microanalysis</i> , 2017, 23, 924-925.  | 0.2  | 0         |
| 50 | Hydrogen embrittlement of grain boundaries in nickel: an atomistic study. <i>Npj Computational Materials</i> , 2017, 3, .   | 3.5  | 45        |
| 51 | Tuning the Outward to Inward Swelling in Lithiated Silicon Nanotubes via Surface Oxide Coating. <i>Microscopy and Microanalysis</i> , 2017, 23, 2018-2019.  | 0.2  | 0         |
| 52 | Mechanically Driven Grain Boundary Formation in Nickel Nanowires. <i>ACS Nano</i> , 2017, 11, 12500-12508.  | 7.3  | 28        |
| 53 | Brittle Fracture of 2D MoSe <sub>2</sub> . <i>Advanced Materials</i> , 2017, 29, 1604201.   | 11.1 | 138       |
| 54 | New twinning route in face-centered cubic nanocrystalline metals. <i>Nature Communications</i> , 2017, 8, 2142.   | 5.8  | 110       |

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|----|--|------|-----------|
| 55 | Gradient plasticity in gradient nano-grained metals. <i>Extreme Mechanics Letters</i> , 2016, 8, 213-219.  | 2.0  | 176       |
| 56 | The mechanics of large-volume-change transformations in high-capacity battery materials. <i>Extreme Mechanics Letters</i> , 2016, 9, 480-494.  | 2.0  | 101       |
| 57 | Modeling of Lithiation in Silicon Electrodes. <i>Springer Series in Materials Science</i> , 2016, , 489-506.   | 0.4  | 0         |
| 58 | Environmentally Assisted Cracking in Silicon Nitride Barrier Films on Poly(ethylene terephthalate) Substrates. <i>ACS Applied Materials &amp; Interfaces</i> , 2016, 8, 27169-27178.                             | 4.0  | 25        |
| 59 | Cycling of a Lithium-Ion Battery with a Silicon Anode Drives Large Mechanical Actuation. <i>Advanced Materials</i> , 2016, 28, 10236-10243.  | 11.1 | 40        |
| 60 | Tuning the Outward to Inward Swelling in Lithiated Silicon Nanotubes via Surface Oxide Coating. <i>Nano Letters</i> , 2016, 16, 5815-5822.   | 4.5  | 45        |
| 61 | In situ observation of shear-driven amorphization in silicon crystals. <i>Nature Nanotechnology</i> , 2016, 11, 866-871.   | 15.6 | 74        |
| 62 | Mechanics of high-capacity electrodes in lithium-ion batteries. <i>Chinese Physics B</i> , 2016, 25, 014601.   | 0.7  | 10        |
| 63 | Chemomechanical Origin of Hydrogen Trapping at Grain Boundaries in fcc Metals. <i>Physical Review Letters</i> , 2016, 116, 075502.   | 2.9  | 81        |
| 64 | Lithium Sulfide Cathodes: A Hierarchical Particle-Shell Architecture for Long-Term Cycle Stability of Li <sub>2</sub> S Cathodes ( <i>Adv. Mater.</i> 37/2015). <i>Advanced Materials</i> , 2015, 27, 5578-5578. | 11.1 | 1         |
| 65 | A Hierarchical Particle-Shell Architecture for Long-Term Cycle Stability of Li <sub>2</sub> S Cathodes. <i>Advanced Materials</i> , 2015, 27, 5579-5586.   | 11.1 | 111       |
| 66 | In situ atomic-scale observation of twinning-dominated deformation in nanoscale body-centred cubic tungsten. <i>Nature Materials</i> , 2015, 14, 594-600.  | 13.3 | 250       |
| 67 | Nanoscale Deformation Analysis With High-Resolution Transmission Electron Microscopy and Digital Image Correlation. <i>Journal of Applied Mechanics, Transactions ASME</i> , 2015, 82, .                         | 1.1  | 26        |
| 68 | Griffith Criterion for Brittle Fracture in Graphene. <i>Nano Letters</i> , 2015, 15, 1918-1924.  | 4.5  | 180       |
| 69 | Fracture in a thin film of nanotwinned copper. <i>Acta Materialia</i> , 2015, 98, 313-317.   | 3.8  | 54        |
| 70 | Fog spontaneously folds mosquito wings. <i>Physics of Fluids</i> , 2015, 27, .   | 1.6  | 23        |
| 71 | Strain Hardening and Size Effect in Five-fold Twinned Ag Nanowires. <i>Nano Letters</i> , 2015, 15, 4037-4044.   | 4.5  | 122       |
| 72 | High damage tolerance of electrochemically lithiated silicon. <i>Nature Communications</i> , 2015, 6, 8417.  | 5.8  | 96        |

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|----|---|------|-----------|
| 73 | Structural Evolution and Pulverization of Tin Nanoparticles during Lithiation-Delithiation Cycling. Journal of the Electrochemical Society, 2014, 161, F3019-F3024.                               | 1.3  | 96        |
| 74 | Structural transformations in NiTi shape memory alloy nanowires. Journal of Applied Physics, 2014, 115, .   | 1.1  | 54        |
| 75 | A chemo-mechanical model of lithiation in silicon. Journal of the Mechanics and Physics of Solids, 2014, 70, 349-361.   | 2.3  | 181       |
| 76 | Fracture toughness of graphene. Nature Communications, 2014, 5, 3782.   | 5.8  | 567       |
| 77 | Crystal plasticity model for BCC iron atomistically informed by kinetics of correlated kinkpair nucleation on screw dislocation. Journal of the Mechanics and Physics of Solids, 2014, 65, 54-68. | 2.3  | 68        |
| 78 | Germanium-Based Electrode Materials for Lithium-Ion Batteries. ChemElectroChem, 2014, 1, 706-713.   | 1.7  | 59        |
| 79 | Constitutive equations for modeling non-Schmid effects in single crystal bcc-Fe at low and ambient temperatures. International Journal of Plasticity, 2014, 59, 1-14.                             | 4.1  | 85        |
| 80 | Atomic-scale dynamic process of deformation-induced stacking fault tetrahedra in gold nanocrystals. Nature Communications, 2013, 4, 2340.   | 5.8  | 104       |
| 81 | Mechanical properties of amorphous Li <sub>x</sub> Si alloys: a reactive force field study. Modelling and Simulation in Materials Science and Engineering, 2013, 21, 074002.                      | 0.8  | 103       |
| 82 | Plastic anisotropy and associated deformation mechanisms in nanotwinned metals. Acta Materialia, 2013, 61, 217-227.   | 3.8  | 272       |
| 83 | Tough Germanium Nanoparticles under Electrochemical Cycling. ACS Nano, 2013, 7, 3427-3433.  | 7.3  | 184       |
| 84 | Self-Limiting Lithiation in Silicon Nanowires. ACS Nano, 2013, 7, 1495-1503.  | 7.3  | 212       |
| 85 | Two-Phase Electrochemical Lithiation in Amorphous Silicon. Nano Letters, 2013, 13, 709-715.   | 4.5  | 377       |
| 86 | Strain rate dependent mechanical properties in single crystal nickel nanowires. Applied Physics Letters, 2013, 102, .   | 1.5  | 42        |
| 87 | In situ atomic-scale imaging of electrochemical lithiation in silicon. Nature Nanotechnology, 2012, 7, 749-756.   | 15.6 | 533       |
| 88 | Orientation-Dependent Interfacial Mobility Governs the Anisotropic Swelling in Lithiated Silicon Nanowires. Nano Letters, 2012, 12, 1953-1958.  | 4.5  | 212       |
| 89 | Size-Dependent Fracture of Silicon Nanoparticles During Lithiation. ACS Nano, 2012, 6, 1522-1531.   | 7.3  | 1,816     |
| 90 | In Situ TEM Experiments of Electrochemical Lithiation and Delithiation of Individual Nanostructures. Advanced Energy Materials, 2012, 2, 722-741.   | 10.2 | 341       |

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|-----|--|------|-----------|
| 91  | Size effects and strength fluctuation in nanoscale plasticity. <i>Acta Materialia</i> , 2012, 60, 3302-3309.   | 3.8  | 32        |
| 92  | Plastic deformation mechanism in nanotwinned metals: An insight from molecular dynamics and mechanistic modeling. <i>Scripta Materialia</i> , 2012, 66, 843-848.   | 2.6  | 205       |
| 93  | Controlling the Lithiation-Induced Strain and Charging Rate in Nanowire Electrodes by Coating. <i>ACS Nano</i> , 2011, 5, 4800-4809.   | 7.3  | 135       |
| 94  | Anisotropic Swelling and Fracture of Silicon Nanowires during Lithiation. <i>Nano Letters</i> , 2011, 11, 3312-3318.   | 4.5  | 691       |
| 95  | Lithiation-Induced Embrittlement of Multiwalled Carbon Nanotubes. <i>ACS Nano</i> , 2011, 5, 7245-7253.  | 7.3  | 122       |
| 96  | Reversible Nanopore Formation in Ge Nanowires during Lithiationâ€“Delithiation Cycling: An In Situ Transmission Electron Microscopy Study. <i>Nano Letters</i> , 2011, 11, 3991-3997.                    | 4.5  | 356       |
| 97  | Atomistic mechanisms of lithium insertion in amorphous silicon. <i>Journal of Power Sources</i> , 2011, 196, 3664-3668.  | 4.0  | 108       |
| 98  | Atomistic study of nanotwins in NiTi shape memory alloys. <i>Journal of Applied Physics</i> , 2011, 110, .   | 1.1  | 90        |
| 99  | Ultra-strength materials. <i>Progress in Materials Science</i> , 2010, 55, 710-757.  | 16.0 | 696       |
| 100 | Nanoscale fracture in graphene. <i>Chemical Physics Letters</i> , 2010, 494, 218-222.  | 1.2  | 111       |
| 101 | Integration of planar and bulk heterojunctions in polymer/nanocrystal hybrid photovoltaic cells. <i>Applied Physics Letters</i> , 2009, 95, 063510.  | 1.5  | 35        |
| 102 | Colloidal nanocrystal-based light-emitting diodes fabricated on plastic toward flexible quantum dot optoelectronics. <i>Journal of Applied Physics</i> , 2009, 105, .                                    | 1.1  | 43        |
| 103 | Mechanics of Ultra-Strength Materials. <i>MRS Bulletin</i> , 2009, 34, 167-172.  | 1.7  | 105       |
| 104 | Size dependence of rate-controlling deformation mechanisms in nanotwinned copper. <i>Scripta Materialia</i> , 2009, 60, 1062-1066.   | 2.6  | 88        |
| 105 | Stress relaxation and the structure size-dependence of plastic deformation in nanotwinned copper. <i>Acta Materialia</i> , 2009, 57, 5165-5173.  | 3.8  | 156       |
| 106 | Mechanics of nanocrack: Fracture, dislocation emission, and amorphization. <i>Journal of the Mechanics and Physics of Solids</i> , 2009, 57, 840-850.  | 2.3  | 76        |
| 107 | Simulating nanoindentation and predicting dislocation nucleation using interatomic potential finite element method. <i>Computer Methods in Applied Mechanics and Engineering</i> , 2008, 197, 3174-3181. | 3.4  | 28        |
| 108 | Temperature and Strain-Rate Dependence of Surface Dislocation Nucleation. <i>Physical Review Letters</i> , 2008, 100, 025502.  | 2.9  | 587       |

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|-----|---|------|-----------|
| 109 | Composition-limited spectral response of hybrid photovoltaic cells containing infrared PbSe nanocrystals. <i>Journal of Applied Physics</i> , 2008, 104, 044306.  | 1.1  | 19        |
| 110 | Developing bright and color-saturated quantum dot light emitting diodes towards next generation displays and solid state lighting. , 2008, , .  |      | 0         |
| 111 | Circular polarization emission from an external cavity diode laser. <i>Applied Physics Letters</i> , 2008, 92, 111109.  | 1.5  | 14        |
| 112 | Atomistic and multiscale analyses of brittle fracture in crystal lattices. <i>Physical Review B</i> , 2007, 76, .   | 1.1  | 55        |
| 113 | Interfacial plasticity governs strain rate sensitivity and ductility in nanostructured metals. <i>Proceedings of the National Academy of Sciences of the United States of America</i> , 2007, 104, 3031-3036.     | 3.3  | 522       |
| 114 | Bright, multicoloured light-emitting diodes based on quantum dots. <i>Nature Photonics</i> , 2007, 1, 717-722.  | 15.6 | 1,042     |
| 115 | Atomistic characterization of three-dimensional lattice trapping barriers to brittle fracture. <i>Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences</i> , 2006, 462, 1741-1761. | 1.0  | 36        |
| 116 | Microcavity Light Emitting Devices Based on Colloidal Semiconductor Nanocrystal Quantum Dots. , 2006, , .   |      | 0         |
| 117 | Efficient harvest of near infrared light in nanocrystal-polymer hybrid photovoltaic composites. , 2006, , .   |      | 0         |
| 118 | Stress-dependent molecular pathways of silicaâ€“water reaction. <i>Journal of the Mechanics and Physics of Solids</i> , 2005, 53, 1597-1623.  | 2.3  | 114       |
| 119 | Nanomechanics of Crack Front Mobility. <i>Journal of Applied Mechanics, Transactions ASME</i> , 2005, 72, 932-935.  | 1.1  | 3         |
| 120 | Atomistic Configurations and Energetics of Crack Extension in Silicon. <i>Physical Review Letters</i> , 2004, 93, 205504.   | 2.9  | 58        |
| 121 | Predictive modeling of nanoindentation-induced homogeneous dislocation nucleation in copper. <i>Journal of the Mechanics and Physics of Solids</i> , 2004, 52, 691-724.   | 2.3  | 227       |
| 122 | Atomistic Study of Dislocation Loop Emission from a Crack Tip. <i>Physical Review Letters</i> , 2004, 93, 025503.   | 2.9  | 192       |
| 123 | Computer Modeling Study of the Effect of Hydration on the Stability of a Silica Nanotube. <i>Nano Letters</i> , 2003, 3, 1347-1352.   | 4.5  | 53        |
| 124 | Quantifying the early stages of plasticity through nanoscale experiments and simulations. <i>Physical Review B</i> , 2003, 67, .  | 1.1  | 361       |
| 125 | Deformation and Fracture of a SiO <sub>2</sub> Nanorod. <i>Molecular Simulation</i> , 2003, 29, 671-676.  | 0.9  | 36        |
| 126 | Atomistic mechanisms governing elastic limit and incipient plasticity in crystals. <i>Nature</i> , 2002, 418, 307-310.  | 13.7 | 621       |