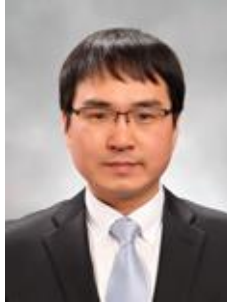




# Seoul National University

Materials Science and Engineering



## Gwan-Hyoung Lee

*Associate Professor*

*Materials Science and Engineering*

*Seoul National University, Seoul 08826, Korea*

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### Education

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B. S. 1995.3 - 2000.2 **Seoul National University** / Materials Science and Engineering  
Ph. D. 2000.3 - 2006.8 **Seoul National University** / Materials Science and Engineering

### Academic and Industrial Experience

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2002.08 – 2003.08	<b>University of Illinois at Urbana-Champaign</b> / Materials Science and Engineering	<i>Visiting Scholar</i>
2006.09 – 2008.12	<b>Samsung Electronics</b> / LCD Business	Senior Engineer
2009.01 – 2010.02	<b>Samsung Mobile Display Co.</b> / OLED Business	Senior Engineer
2010.03 – 2014.02	<b>Columbia University</b> / Mechanical Engineering	Postdoctoral Scientist
2014.03 – 2017.08	<b>Yonsei University</b> / Materials Science and Engineering	Assistant Professor
2017.09 – 2019.02	<b>Yonsei University</b> / Materials Science and Engineering	Associate Professor
2019.03 – present	<b>Seoul National University</b> / Materials Science and Engineering	Associate Professor

### Academic Activities

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#### **Journal Reviewer:**

Nature Nanotechnology, Nature Communications, Nature Electronics, Nature Sustainability, Advanced Materials, Nano Letters, ACS Nano, Advanced Functional Materials, Advanced Electronic Materials Nano Today, 2D Materials, Carbon, ACS Applied Materials and Interfaces, ACS Catalysts, Nanoscale, NPG Asia Materials, Journal of Materials Chemistry C, Scientific Reports, Applied Physics Letters, Journal of Applied Physics, Journal of Alloys and Compounds, Journal of Physical Chemistry, AIP Advances, Science Advances, Journal of Physical Chemistry Letters, Organic Electronics, Nanoscale Horizons

#### **Journal Editor:**

Thin Solid Films (2017-present, Review editor), Ceramist (2019-present, Deputy editor), Journal of Physics: Condensed Matter (2016, Guest editor), MRS Advances (2018-present, Principal editor)

#### **Committee Member of Conferences:**

Materials Research Society (MRS), American Vacuum Society (AVS), Korean Ceramic Society(KCS), Korean Physics Society (KPS), Korean Graphene Research Society, International Meeting on Information Display (IMID), Nano Korea, Recent Progress on Graphene/2D Research (RPGR), Graphene Symposium, Engineering and Nanotechnology of Green Energy (ENGE), International Conference on Advanced Materials and Devices (ICAMD), Korea Society of LEDs and Optoelectronics (KSLOE)

### Awards

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- [9] Young Ceramist (Korean Ceramic Society), 2018
- [8] Award for the Excellent Research from Samsung Electro-Mechanics Corp., 2018
- [7] Award for the Excellence in Research from Yonsei University President, 2018
- [6] Award for the Best Lecturing Professor from Yonsei University President, 2017
- [5] Award for the Excellence in Research from Yonsei University President, 2017
- [4] Award for the Excellence in Research from Yonsei University President, 2016
- [3] Award for the Best Lecturing Professor from Yonsei University President, 2015
- [2] Samsung Humantech Research Award, 2006  
“Photoluminescent Properties and Crystalline Structure of  $\text{Eu}^{3+}$  and  $\text{Sm}^{3+}$  Doped Potassium Tungstate Phosphor for White LEDs”
- [1] Best Poster Prize in International Meeting on Informational Display 2005  
“Luminescence of  $\text{Eu}^{3+}$  and  $\text{Sm}^{3+}$  Doped Potassium Tungstate Phosphor”

### **Publications**

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- [75] “Atomic Scale Study for Black Phosphorus Degradation”  
Changbae Hyun, Jong Hun Kim, Jong-Young Lee, Gwan-Hyoung Lee, \* Kwang S. Kim\*  
*RSC Advances* Just accepted
- [74] “Two-dimensional Materials for Electronic and Optoelectronic Applications: Potential and Challenge”  
Sojung Kang, + Donghun Lee, + Jong Hun Kim, Andrea Capasso, Hee Seong Kang, Chul-Ho Lee, \* Gwan-Hyoung Lee\*  
*2D Materials* Just accepted
- [73] “Thickness-insensitive Properties of  $\alpha$ - $\text{MoO}_3$  Nanosheets by Weak Interlayer Coupling”  
Jong Hun Kim, + Changbae Hyun, + Hangyel Kim, + Jatis Kumar Dash, Gwan-Hyoung Lee  
*Nano Letters* Just accepted
- [72] “No Tilt Angle Dependence of Grain Boundary on Mechanical Strength of Chemically Deposited Graphene Film”  
Jonghun Kim, + Sung Joo An, + Jong-Young Lee, Eunji Ji, James Hone, Gwan-Hyoung Lee  
*Journal of Korean Ceramic Society* 56, 506-512 (2019)
- [71] “Lattice Strain Formation through Spin-Coupled Shells of  $\text{MoS}_2$  on  $\text{Mo}_2\text{C}$  for Bifunctional Oxygen Reduction and Oxygen Evolution Reaction Electrocatalysts”  
Anand P. Tiwari, Yeoheung Yoon, Travis G. Novak, Minhe Lee, Ashraful Azam, Sun Sook Lee, Gwan-Hyoung Lee, Ki-Seok An, \* Seokwoo Jeon\*  
*Advanced Materials Interfaces* 1900948 (2019)
- [70] “Ferroelectric Polymer Enabled Contactless Electric Power Generation in Triboelectric Nanogenerators”  
Hyun Soo Kim, Dong Yeong Kim, Jae-Eun Kim, Jong Hun Kim, Dae Sol Kong, Gonzalo Murillo, Gwan-Hyoung Lee, Jeong Young Park, \* Jong Hoon Jung\*  
*Advanced Functional Materials* 29, 1905816 (2019)
- [69] “Tailoring Surface Properties via Functionalized Hydrofluorinated Graphene Compounds”  
Jangyup Son, Nikita Buzov, Sihan Chen, Dongchul Sung, Huije Ryu, Jun-Young Kwon, Sunphil Kim, Jingwei Xu, Suklyun Hong, William P. King, Gwan-Hyoung Lee, Arend van der Zande  
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- [68] “All-2D  $\text{ReS}_2$  Transistors with Split Gates for Logic Circuitry”  
Junyoung Kwon, Yongjun Shin, Hyeokjae Kwon, Jae Yoon Lee, Hyunik Park, Kenji Watanabe, Takashi Taniguchi, Jihyun Kim, Chul-Ho Lee, Seongil Im, Gwan-Hyoung Lee  
*Scientific Reports* 9, 10354 (2019)
- [67] “High-performance Monolayer  $\text{MoS}_2$  Field-effect Transistor with Large-scale Nitrogen-doped Graphene



- Electrodes for Ohmic Contact”  
Dongjea Seo, Dong Yun Lee, Jungyoung Kwon, Jea Jung Lee, Takashi Taniguchi, Kenji Watanabe, Gwan-Hyoung Lee, Keun Soo Kim, James Hone, Young Duck Kim\*, Heon-jin Choi\*  
*Applied Physics Letters* 115, 012104 (2019)
- [66] “Multifunctional Two-Dimensional PtSe<sub>2</sub>-Layer Kirigami Conductors with 2000% Stretchability and Metallic-to-Semiconducting Tunability”  
Emmanuel Okogbue, Sang Sub Han, Tae-Jun Ko, Hee-Suk Chung, Jinwoo Ma, Mashiyat Sumaiya Shawkat, Jung Han Kim, Jong Hun Kim, Eunji Ji, Kyu Hwan Oh, Lei Zhai, Gwan-Hyoung Lee, Yeonwoong Jung  
*Nano Letters* 19, 7598-7607 (2019)
- [65] “Phonon-assisted Carrier Transport through a Lattice-mismatched Interfaceon-Assisted Carrier Transport through Lattice-Mismatched Interface”  
Hyong Seo Yoon, Jeong Seob Kang, Jae Young Park, JeongSeob Kang, Junyoung Kwon, Teresa Cusati, Gianluca Fiori, Giuseppe Iannaccone, Alessandro Fortunelli, V. Ongun Ozcelik, Gwan-Hyoung Lee,\* Tony Low, Seong Chan Jun\*  
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- [64] “Horizontal-to-Vertical Transition of 2D Layer Orientation in Low-Temperature CVD-Grown PtSe<sub>2</sub> and Its Influences on Electrical Properties and Device Applications”  
Sang Sub Han, Jong Hun Kim, Chanwoo Noh, Jung Han Kim, Eunji Ji, Junyoung Kwon, Seung Min Yu, Tae-Jun Ko, Emmanuel Okogbue, Kyu Hwan Oh, Hee-Suk Chung,\* YounJoon Jung,\* Gwan-Hyoung Lee,\* Yeonwoong Jung\*  
*ACS Applied Materials & Interfaces* 11, 13598-13607 (2019)
- [63] “Electrically Conducting and Mechanically Strong Graphene-Polylactic Acid Composites for 3D Printing”  
Mirae Kim,+ Jae-Hwan Jeong,+ Jong-Young Lee, Seok-Hyeon Kang, Sanghyuk Kwon, Changgu Lee, Young-Kook Lee, Gwan-Hyoung Lee  
*ACS Applied Materials & Interfaces* 11, 11841–11848 (2019)
- [62] “Recent Progress in Growth of Two-dimensional Transition Metal Dichalcogenides”  
Yeonjoon Jung,\* Eunji Ji,\* Andrea Capasso, and Gwan-Hyoung Lee  
*Journal of Korean Ceramic Society* 56, 24-36 (2019)
- [61] “Carbon Dots Dispersed on Graphene/SiO<sub>2</sub>/Si: A Morphological Study”  
Giuliana Faggio, Andrea Gnisci, Giacomo Messina, Nicola Lisi, Andrea Capasso, Gwan-Hyoung Lee, Angelo Armano, Alice Sciortino, Fabrizio Messina, Marco Cannas, Franco Mario Gelardi, Emanuela Schilirò, Filippo Giannazzo, Simonpietro Agnello  
*Physica Status Solidi A* 216, 1800559 (2019)
- [60] “Ambipolar Memristive Phenomenon in Large-Scale, Few-Layered  $\alpha$ MoO<sub>3</sub> Recrystallized Films”  
Hyungsik Kim, Gwan-Hyoung Lee, James Hone, Kenneth L. Shepard  
*Advanced Materials Interfaces* 6, 1801591 (2019)
- [59] “Microwave Weld Single-walled Carbon Nanotube as a Suitable Electrode for Triboelectric Energy Harvesting from Biomaterials and Bioproducts”  
Hyun Soo Kim, Dong Yeong Kim, Ji Hye Kwak, Jong Hun Kim, Munkang Choi, Do Hyung Kim, Dong Woo Lee, Dae Sol Kong, Jinhong Park, Sunshin Jung, Gwan-Hyoung Lee, Minbaek Lee, Jong Hoon Jung  
*Nano Energy* 56, 338-346 (2019)
- [58] “Mechanical Properties of Two-dimensional Materials and Their Applications”  
Jong Hun Kim,+ Jae Hwan Jeong,+ Namwon Kim, Rakesh Joshi, Gwan-Hyoung Lee  
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- [57] “van der Waals Epitaxial Growth of Single Crystal  $\alpha$ -MoO<sub>3</sub> Layers on Layered Materials Growth Templates”  
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*Journal of Physical Chemistry C* 122, 28830–28838 (2018)
- [55] “Atomically-precise Graphene Etch Stops for 3D Integrated Systems from 2D Material Heterostructures”  
Jangyup Son,<sup>+</sup> Junyoung Kwon,<sup>+</sup> SunPhil Kim, Yinchuan Lv, Jaehyung Yu, Jong-Young Lee, Huije Ryu, Kenji Watanabe, Takashi Taniguchi, Rita Garrido-Menacho, Nadya Mason, Elif Ertekin, Pinshane Y. Huang, Gwan-Hyoung Lee,\* Arend van der Zande\*  
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Sum-Gyun Yi, Myung Uk Park, Sung Hyun Kim, Chang Jun Lee, Junyoung Kwon, Gwan-Hyoung Lee, Kyung-Hwa Yoo  
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- [53] “A Controlled Carburization Process to Obtain Graphene-Fe<sub>3</sub>C-Fe Composites”  
Yi You, Masamichi Yoshimura, Sagar Cholake, Gwan-Hyoung Lee, Veena Sahajwalla, Rakesh Joshi  
*Advanced Materials Interfaces* 5, 1800599 (2018)
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Jinsung Kwak, Yongsu Jo, Jung Hwa Kim, Se-Yang Kim, Jae-Ung Lee, Seunguk Song, Jungmin Park, Gun-Do Lee, Jung-Woo Yoo, Sung Youb Kim, Youngmin Kong, Gwan-Hyoung Lee, Wan-Gyu Lee, Xiaodong Xu, Hyeonsik Cheong, Euijoon Yoon, Zonghoon Lee, Soon-Yong Kwon  
*Advanced Materials* 30, 1707260 (2018)
- [51] “Quantitative Analysis of Improved Bending Fracture Behavior of Large-Scale Graphene Monolayer-Intervened Flexible ZnO:Al Thin Films”  
Hong Je Choi, Da Bin Kim, Moo Hyun Kim, Gwan-Hyoung Lee, Yong Soo Cho  
*Journal of Materials Chemistry C* 6, 6125-6131 (2018)  
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- [50] “Scaling and Mechanism of Droplet Array Formation on a Laser-ablated Superhydrophobic Grid”  
Bahador Farshchian, Javad R. Gatabi, Steven M. Bernick, Gwan-Hyoung Lee, Ravindranath Droopad, Namwon Kim  
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- [49] “Rolling Up Two-dimensional Sheets into Nanoscrolls”  
Eunji Ji, Jangyup Son, Jong Hun Kim, Gwan-Hyoung Lee  
*FlatChem* 7, 26-33 (2018)
- [48] “Noble Metal-Coated MoS<sub>2</sub> Nanofilms with Vertically-Aligned 2D Layers for Visible Light-Driven Photocatalytic Degradation of Emerging Water Contaminants”  
Md Ashraful Islam, Jared Church, Changseok Han, Hee-Suk Chung, Eunji Ji, Jong Hun Kim, Nitin Choudhary, Gwan-Hyoung Lee, Woo Hyoung Lee, Yeonwoong Jung  
*Scientific Reports* 7, 14944 (2017)
- [47] “Recovery of Pristine Surface of Black Phosphorus by Water Rinsing and Its Device Applications”  
Suhyun Kim,<sup>+</sup> Jong-Young Lee,<sup>+</sup> Chul-Ho Lee, Gwan-Hyoung Lee\*, Jihyun Kim\*  
*ACS Applied Materials & Interfaces* 9, 21382–21389 (2017)
- [46] “Homogeneous 2D MoTe<sub>2</sub> p–n Junctions and CMOS Inverters formed by Atomic-Layer-Deposition-Induced Doping”  
June Yeong Lim, Atiye Pezeshki, Jin Sung Kim, Young Taek Lee, Sanghyuck Yu, Do Kyung Hwang, Hyoung Joon Choi, Gwan-Hyoung Lee, Seongil Im  
*Advanced Materials* 29, 1701798 (2017)
- [45] “Thickness-dependent Schottky Barrier Height of MoS<sub>2</sub> Field-effect Transistors”  
Junyoung Kwon,<sup>+</sup> Jong-Young Lee,<sup>+</sup> Young-Jun Yu, Chul-Ho Lee, Xu Cui, James Hone, Gwan-Hyoung Lee\*



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## Materials Science and Engineering

- Nanoscale* 9, 6151-6157 (2017)
- [44] “Direct Observation of Grain Boundaries in Chemical Vapor Deposited Graphene”  
Jong-Young Lee, Ji-Hwan Lee, Min Jung Kim, Jatis Kumar Dash, Chul-Ho Lee, Rakesh Joshi, Sunwoo Lee, James Hone, Aloysius Soon, Gwan-Hyoung Lee  
*Carbon* 115, 147–153 (2017)
- [43] “Epitaxially Self-Assembled Alkane Layers for Graphene Electronics”  
Young-Jun Yu,<sup>+</sup> Gwan-Hyoung Lee,<sup>+</sup> Ji Il Choi, Chul-Ho Lee, Seok Ju Kang, Sunwoo Lee, Kwang Taeg Rim, Yoon Su Shim, George W. Flynn, James Hone, Yong-Hoon Kim, Philip Kim, Colin Nuckolls, Seokhoon Ahn  
*Advanced Materials* 29, 1603925 (2017)
- [42] “Two-dimensional Semiconductor Optoelectronics based on van der Waals Heterostructures”  
Jae Yoon Lee, Jun-Hwan Shin, Gwan-Hyoung Lee,\* Chul-Ho Lee\*  
*Nanomaterials* 6, 193 (2016)
- [41] “Laser-induced Superhydrophobic Grid Patterns on PDMS for Droplet Arrays Formation”  
Bahador Farshchian, Javad R. Gatabi, Steven M. Bernick, Sooyeon Park, Gwan-Hyoung Lee, Ravindranath Droopad, Namwon Kim  
*Applied Surface Science* 396, 359–365 (2016)
- [40] “Gate-tunable Hole and Electron Carrier Transport in Atomically Thin Dual-Channel WSe<sub>2</sub>/MoS<sub>2</sub> Heterostructure for Ambipolar Field-Effect Transistor”  
Inyeal Lee, Servin Rathi, Dongsuk Lim, Lijun Li, Jinwoo Park, Yoontae Lee, Kyung Soo Yi, Krishna P. Dhakal, Jeongyong Kim, Changgu Lee, Gwan-Hyoung Lee, Young Duck Kim, James Hone, Sun Jin Yun, Doo-Hyeb Youn, Gil-Ho Kim  
*Advanced Materials* 28, 9519–9525 (2016)
- [39] “In Situ Thickness Control of Black Phosphorus Field-Effect Transistors via Ozone Treatment”  
Suhyun Kim, Younghun Jung, Jong-Young Lee, Gwan-Hyoung Lee,\* Jihyun Kim\*  
*Nano Research* 9, 3056-3065 (2016)
- [38] “Vertically Grown Nanowire Crystals of Dibenzotetrathienocoronene (DBTTC) on Large-area Graphene”  
Bumjung Kim, Chien-Yang Chiu, Seok-Ju Kang, Keun Soo Kim, Gwan-Hyoung Lee, Zheyuan Chen, Seokhoon Ahn, Kevin G. Yager, James Ciston, Colin Nuckolls, Theanne Schiros  
*RSC Advances* 6, 59582-59589 (2016)
- [37] “Tuning the Thickness of Black Phosphorus via Ion Bombardment-free Plasma for Device Performance Improvement”  
Geonyeop Lee, Jong-Young Lee, Gwan-Hyoung Lee,\* Jihyun Kim\*  
*Journal of Materials Chemistry C* 4, 6234-6239 (2016)
- [36] “Hydrogen Generation via Photoelectrochemical Water Splitting Using Chemically Exfoliated MoS<sub>2</sub> Layers”  
Rakesh Joshi, Shobha Shukla, Sumit Saxena, Gwan-Hyoung Lee, Veena Sahajwalla, Subbiah Alwarappan  
*AIP Advances* 6, 015315 (2016)
- [35] “Blu-ray Based Optomagnetic Aptasensor for Detection of Small Molecules”  
Jaeyoung Yang, Marco Donolato, Alessandro Pinto, Filippo Giacomo Bosco, En-Te Hwu, Ching-Hsiu Chen, Tommy Sonne Alstrøm, Gwan-Hyoung Lee, Thomas Schäfer, Paolo Vavassori, Anja Boisen, Qiao Lin, Mikkel Fougt Hansen  
*Biosensors and Bioelectronics* 75, 396–403 (2016)
- [34] “Measurement of Lateral and Interfacial Thermal Conductivity of Single- and Bi-Layer MoS<sub>2</sub> and MoSe<sub>2</sub> using Refined Optothermal Raman Technique”  
Xian Zhang, Dezheng Sun, Yilei Li, Gwan-Hyoung Lee, Xu Cui, Daniel Chenet, Yumeng You, Tony Heinz, James Hone  
*ACS Applied Materials & Interfaces* 7, 25923-25929 (2015)
- [33] “Tunable Electrical and Optical Characteristics in Monolayer Graphene and Few-Layer MoS<sub>2</sub> Heterostructure Devices”



# Seoul National University

Materials Science and Engineering

- Servin Rathi\*, Inyeal Lee\*, Dongsuk Lim, Jianwei Wang, Yuichi Ochiai, Nobuyuki Aoki, Kenji Watanabe, Takashi Taniguchi, Gwan-Hyoung Lee, Young-Jun Yu, Philip Kim, Gil-Ho Kim (\*equally contributed)  
*Nano Letters* 15, 5017-5024 (2015)
- [32] “Highly Stable, Dual-Gated MoS<sub>2</sub> Transistors Encapsulated by Hexagonal Boron Nitride with Gate-Controllable Contact Resistance and Threshold Voltage”  
Gwan-Hyoung Lee,<sup>+</sup> Xu Cui,<sup>+</sup> Young Duck Kim, Ghidewon Arefe, Xian Zhang, Chul-Ho Lee, Fan Ye, Kenji Watanabe, Takashi Taniguchi, Philip Kim, James Hone  
*ACS Nano* 9, 7019–7026 (2015)
- [31] “Multi-Terminal Transport Measurements of MoS<sub>2</sub> Using van der Waals Heterostructure Device Platform”  
Xu Cui,<sup>+</sup> Gwan-Hyoung Lee,<sup>+</sup> Young Duck Kim,<sup>+</sup> Ghidewon Arefe, Pinshane Y. Huang, Chul-Ho Lee, Daniel A. Chenet, Xian Zhang, Lei Wang, Fan Ye, Filippo Pizzocchero, Bjarke S. Jessen, Kenji Watanabe, Takashi Taniguchi, David A. Muller, Tony Low, Philip Kim, James Hone  
*Nature Nanotechnology* 10, 534–540 (2015)
- [30] “An Aptameric Graphene Nanosensor for Label-Free Detection of Small-Molecule Biomarkers”  
Cheng Wang, Jinho Kim, Yibo Zhu, Jaeyoung Yang, Gwan-Hyoung Lee, Sunwoo Lee, Jaeeun Yu, Renjun Pei, Guohua Liu, Colin Nuckolls, James Hone, Qiao Lin  
*Biosensors and Bioelectronics* 71, 222-229 (2015)
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Gwan-Hyoung Lee,<sup>+</sup> Chul-Ho Lee,<sup>+</sup> Arend M. van der Zande, Minyong Han, Xu Cui, Ghidewon Arefe, Colin Nuckolls, Tony F. Heinz, James Hone, Philip Kim  
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Chul-Ho Lee, Gwan-Hyoung Lee, Arend M. van der Zande, Wenchao Chen, Yilei Li, Minyong Han, Xu Cui, Ghidewon Arefe, Colin Nuckolls, Tony F. Heinz, Jing Guo, James Hone, Philip Kim  
*Nature Nanotechnology* 9, 676-681 (2014)
- [27] “Organic Field Effect Transistors Based on Graphene and Hexagonal Boron Nitride Heterostructures”  
Seok Ju Kang,<sup>+</sup> Gwan-Hyoung Lee,<sup>+</sup> Young-Jun Yu,<sup>+</sup> Yue Zhao, Bumjung Kim, Kenji Watanabe, Takashi Taniguchi, James Hone, Philip Kim, Colin Nuckolls  
*Advanced Functional Materials* 24, 5157-5163 (2014)
- [26] “Effect of Defects on the Intrinsic Strength and Stiffness of Graphene”  
Ardavan Zandiatashbar,<sup>+</sup> Gwan-Hyoung Lee,<sup>+</sup> Sung Joo An, Sunwoo Lee, Nithin Mathew, Mauricio Terrones, Takuya Hayashi, Catalin R. Picu, James Hone, Nikhil Koratkar  
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- [25] “Graphene Mechanical Oscillators with Tunable Frequency”  
Changyao Chen, Sunwoo Lee, Vikram V. Deshpande, Gwan-Hyoung Lee, Michael Lekas, Kenneth Shepard, James Hone  
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Gwan-Hyoung Lee,<sup>+</sup> Young-Jun Yu,<sup>+</sup> Xu Cui, Nicholas Petrone, Chul-Ho Lee, Min Sup Choi, Dae-Yeong Lee, Changgu Lee, Won Jong Yoo, Kenji Watanabe, Takashi Taniguchi, Colin Nuckolls, Philip Kim, James Hone  
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- Cover Image for September, 2013.
- [23] “Graphene Metallization of High-Stress Silicon Nitride Resonators for Electrical Integration”  
Sunwoo Lee, Vivekananda P. Adiga, Robert A. Barton, Arend van der Zande, Gwan-Hyoung Lee, B. Rob Ilic, Alexander Gondarenko, Jeevak M. Parpia, Harold G. Craighead, James Hone  
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## Materials Science and Engineering

- [22] “High Strength Chemical Vapor Deposited Graphene and Grain Boundaries”  
Gwan-Hyoung Lee,<sup>+</sup> Ryan C. Cooper,<sup>+</sup> Sung Joo An, Sunwoo Lee, Arend van der Zande, Nicholas Petrone, Alexandra G. Hammerberg, Changgu Lee, Bryan Crawford, Warren Oliver, Jeffrey W. Kysar, James Hone  
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- [21] “Grains and Grain Boundaries in Highly Crystalline Monolayer Molybdenum Disulphide”  
Arend M. van der Zande, Pinshane Y. Huang, Daniel A. Chenet, Timothy C. Berkelbach, Yu Meng You, Gwan-Hyoung Lee, Tony F. Heinz, David R. Reichman, David A. Muller, James Hone  
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- [20] “Controlled Charge Trapping by MoS<sub>2</sub> and Graphene in Ultrathin Heterostructured Memory Devices”  
Min Sup Choi,<sup>+</sup> Gwan-Hyoung Lee,<sup>+</sup> Young-Jun Yu,<sup>+</sup> Dae-Yeong Lee, Seung Hwan Lee, Philip Kim, James Hone, Won Jong Yoo  
*Nature Communications* 4, 1624 (2013)
- [19] “Effect of Surface Morphology on Friction of Graphene on Various Substrates”  
Dae-Hyun Cho, Lei Wang, Jin-Seon Kim, Gwan-Hyoung Lee, Eok Su Kim, Sunhee Lee, Sang Yoon Lee, James Hone, Changgu Lee  
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- [18] “Electrically Integrated SU-8 Clamped Graphene Drum Resonators for Strain Engineering”  
Sunwoo Lee, Changyao Chen, Vikram V. Deshpande, Gwan-Hyoung Lee, Ilkyu Lee, Michael Lekas, Alexander Gondarenko, Young-Jun Yu, Kenneth Shepard, Philip Kim, James Hone  
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- [17] “Tightly Bound Triions in Monolayer MoS<sub>2</sub>”  
Kin Fai Mak, Keliang He, Changgu Lee, Gwan-Hyoung Lee, James Hone, Tony F. Heinz, Jie Shan  
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- [16] “Graphene Based Heterostructures”  
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- [15] “Electron Tunneling Through Atomically Flat and Ultrathin Hexagonal Boron Nitride”  
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*Applied Physics Letters* 99, 243114 (2011)
- [14] “Inking Elastomeric Stamps with Micro-patterned, Single Layer Graphene to Create High-performance OFETs”  
Seok Ju Kang, Bumjung Kim, Keun Soo Kim, Yue Zhao, Zheyuan Chen, Gwan-Hyoung Lee, James Hone, Philip Kim, Colin Nuckolls  
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- [11] “Studies in Crystal Structure and Luminescence Properties of Eu<sup>3+</sup>-doped Metal Tungstate Phosphors for White LEDs”  
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