Dr. Shaotang Song

Senior Research Fellow, Department of Chemistry, National University of Singapore.

address：3 Science Drive 3, S7 01-06, Singapore 117552

Email：songs@nus.edu.sg

Phone: +65 83068565

Education

Kyoto University	Energy Science	**Ph.D**	2017
Beijing Institute of Technology	Environmental Engineering	**M.S.**	2014
Langfang Normal University	Chemistry	**B.S.**	2010

Professional Experience

Tongji University	**Professor**	2025-
National University of Singapore	**Senior Research Fellow**	2023-2024
National University of Singapore	**Research Fellow**	2021-2023
National University of Singapore	**Visiting Research Fellow**	2018-2020
Ritsumeikan University	**Postdoc**	2018

Award

MEXT scholarship (Japanese Government) 2014

Young Researcher Award (Surface Science Society of Japan) 2017

Young Individual Research Grand Award (A*STAR, Singapore) 2022

Journal Editor/Reviewer

Guest Editor *of molecules.* Reviewer of *Nature Chemistry, Nature Catalysis, Angewandte Chemie, NANO Letter, ACS nano, JACS Au, Nano Research.*

Research Grant as PI

YIRG222K3026 Funding: SGD 320,000 (1,718,400 RMB)

Title: On-surface synthesis of graphene nanoribbons with designer quantum properties for next-generation spintronic applications

Book Writing

Molecular Interactions on Two-Dimensional Materials (chapter 8) ISBN: 978-981-124-784-2

Google scholar profile: https://scholar.google.com/citations?user=r4ZuKAkAAAAJ&hl=en

ORCID: https://orcid.org/0000-0003-3487-3566

Publication

1. **Shaotang Song**, Yu Teng, Weichen Tang, Zhen Xu, Yuanyuan He, Jiawei Ruan, Takahiro Kojima, Wenping Hu, Franz J Giessibl, Hiroshi Sakaguchi*, Steven G Louie*, Jiong Lu*. Janus Graphene Nanoribbons with a Single Ferromagnetic Zigzag Edge, *Nature*, In press. 2024
2. **Shaotang Song**, Andrés Pinar Solé, Adam Matěj, Guangwu Li, Oleksandr Stetsovych, Diego Soler, Huimin Yang, Mykola Telychko, Jing Li, Manish Kumar, Qifan Chen, Shayan Edalatmanesh, Jiri Brabec6, Libor Veis*, Jishan Wu*, Pavel Jelinek*, Jiong Lu*. Highly-Entangled Polyradical Nanographene with Coexisting Strong Correlation and Topological Frustration, *Nature Chemistry*, 16, 938-944 (2024)
3. Hiroshi Sakaguchi*, **Shaotang Song**, Takahiro Kojima, Takahiro Nakae, Homochiral polymerization-driven selective growth of graphene nanoribbons, ***Nature Chemistry***, 9, 57-63, *2017*
4. **Shaotang Song**, Na Guo, Xinzhe Li, Guangwu Li, Yohei Haketa, Mykola Telychko, Jie Su, Pin Lyu, Zhizhan Qiu, Hanyan Fang, Xinnan Peng, Jing Li, Xinbang Wu, Ying Li, Chenliang Su, Ming Joo Koh, Jishan Wu, Hiromitsu Maeda, Chun Zhang, and Jiong Lu* Real-space imaging of a single-molecule monoradical reaction, ***J. Am. Chem. Soc***., 142, 31, 13550–13557, *2020 (**selected as inside cover and Virtural collection issue**)*
5. **Shaotang Song**, Jie Su, Mykola Telychko, Jing Li, Guangwu Li, Ying Li, Chenliang Su,* Jishan Wu,* and Jiong Lu* On-surface synthesis of graphene nanostructures with π-magnetism, ***Chemical Society Reviews***, 50, 3238-3262, *2021*
6. **Shaotang Song**, Lulu Wang, Jie Su, Zhen Xu, C Hsu, Chengqiang Hua, Pin Lyu, Jing Li, Xinnan Peng, Takahiro Kojima, Shunpei Nobusue, Mykola Telychko, Yi Zheng, F Chuang, Hiroshi Sakaguchi*, Ming Wah Wong*, and Jiong Lu*, Manifold Dynamic Non-covalent Interaction for steering Molecular Assembly and Cyclization. ***Chemical Science***, 12, 11659-11667, *2021 **(selected as back cover, and ChemSci Pick of the week collection)***
7. **Shaotang Song**, Pei Wen Ng, Shayan Edalatmanesh, Jiali Li, Andrés Pinar Solé, Tian Yao, Jindřich Kolorenč, Zdenka Sosnová, Oleksander Stetsovych, Xinnan Peng, Jie Su, Jing Li, Hongli Sun, Chenliang Su, Jishan Wu, Franz J. Giessibl, Xiaonan Wang*, Pavel Jelinek*, Chunyan Chi*, Jiong Lu*. Designer magnetic topological graphene nanoribbons arXiv:2204.12880v1, ***Nature*** rebuttal *2023*
8. **Shaotang Song**, Takahiro Kojima, Takahiro Nakae, Hiroshi Sakaguchi, Wide graphene nanoribbons produced by interchain fusion of poly (*p*-phenylene) via two-zone chemical vapor deposition, ***Chem. Commu***., 53, 7034-7036, *2017*
9. **Shaotang Song**, Guanbo Huang, Takahiro Kojima, Takahiro Nakae, Hidemitsu Uno, Hiroshi Sakaguchi, Interchain-linked Graphene Nanoribbons from Dibenzo[*g*,*p*]chrysene via Two-zone Chemical Vapor Deposition, ***Chemistry Letter***, 46, 1525-1527, *2017 **(selected as editor's choice)***
10. **Shaotang Song***, Jie Su, Xinnan Peng, Xinbang Wu, Mykola Telychko, Recent Advances in Bond-Resolved Scanning Tunneling Microscopy, ***Surface Review and Letters***, 2140007, 1-16, *2021*
11. Aitor Calvo-Fernández†, Diego Soler-Polo†, Andrés Pinar Solé†, **Shaotang Song**†, Oleksander Stetsovych, Manish Kumar, Guangwu Li, Jishan Wu, Jiong Lu, Asier Eiguren, María Blanco-Rey, Pavel Jelínek*. Multi-orbital Kondo Screening in Strongly Correlated Polyradical Nanographenes. arXiv:2309.08524, 2023 (**co-first author**)
12. Hongbo Li, Wenyin Wei, Tianwu Wang*, Luzhen Chen, Kai Zhang, Jinyin Xu, Qin Hu, **Shaotang Song***, Yirong Wu and Guangyou Fang* Unveiling Nanoscale THz-STM Imaging Techniques on Graphene Nanoribbon with Zigzag Edge Topology 2024 submitted.
13. Hongli Sun, Like Sun, Yanglong Liao, Zirui Zhou, Jie Ding, **Shaotang Song***, Bin Liu*, Chenliang Su*. Atomically imaging single atom catalysts and their behaviors by scanning tunneling microscopy, **EES Catalysis**, 1, 794-809, *2023*
14. Li Li*, **Shaotang Song**, Xiaoxiao Zhang, Renjie Chen, Jun Lu, Feng Wu*, Khalil Amine, Ultrasonic-assisted co-precipitation to synthesize lithium-rich cathode $Li_{1.3}Ni_{0.21}Mn_{0.64}O_{2+d}$ materials for lithium-ion batteries, ***J. Power Sources***, 272, 922-928, *2014*
15. James Lawrence, Yuanyuan He, Haipeng Wei, Jie Su, **Shaotang Song**, Alina Wania Rodrigues, Daniel Miravet, Pawel Hawrylak, Jianwei Zhao, Jishan Wu, Jiong Lu. Topological Design and Synthesis of High-Spin Aza-triangulenes without Jahn–Teller Distortions. ***ACS nano***, 17, 20237-20245, 2023
16. Mykola Telychko, Guangwu Li, Pingo Mutombo, Diego Soler-Polo, Xinnan Peng, Jie Su, **Shaotang Song**, Ming Joo Koh, Mark Edmonds, Pavel Jelinek, Jishan Wu, Jiong Lu, Ultra-high yield on-surface synthesis and assembly of circumcoronene into chiral electronic Kagome-honeycomb lattice, ***Science Advances***, 7, eabf0269, *2021*
17. Jie Su†, Wei Fan†, Pingo Mutombo†, Xinnan Peng, **Shaotang Song**, Ondráček, Martin; Golub, Pavlo; Brabec, Jiri; Veis, Libor, Mykola Telychko, Pavel Jelinek*, Jishan Wu*, Jiong Lu* On-surface Synthesis and Characterization of [7]Triangulene Quantum Ring, ***Nano Lett.*** 21, 1, 861–867, *2021*

18. Jiali Li, Mykola Telychko, Jun Yin, Yixin Zhu, Guangwu Li, **Shaotang Song**, Haitao Yang, Jing Li, Jishan Wu, Jiong Lu, Xiaonan Wang, Machine Vision Automated Chiral Molecule Detection and Classification in Molecular Imaging, ***J. Am. Chem. Soc.***, 143, 10177-10188, *2021* (**selected as inside cover**)
19. Jie Su, Xinbang Wu, **Shaotang Song**, Mykola Telychko, Jiong Lu, Substrate induced strain for on-surface transformation and synthesis, ***Nanoscale***, 12, 7500-7508, *2020*
20. Jie Su, Mykola Telychko, **Shaotang Song**, Jiong Lu*. Triangulene series: from precursor design towards on-surface synthesis and characterization, ***Angewandte Chemie International Edition*** 132, 2–14, *2020*
21. Mykola Telychko, Lulu Wang, Chia-Hsiu Hsu, Guangwu Li, Xinnan Peng, **Shaotang Song**, Jie Su, Feng-Chuan Chuang, Jishan Wu, Ming Wah Wong, Jiong Lu, Tailoring long-range superlattice chirality in molecular self-assemblies via weak fluorine-mediated interactions, ***Physical Chemistry Chemical Physics***, 23, 21489-21495, 2021
22. Mykola Telychko, Jie Su, Aurelio Gallardo, Yanwei Gu, Jesús I Mendieta-Moreno, Dongchen Qi, Anton Tadich, **Shaotang Song**, Pin Lyu, Zhizhan Qiu, Hanyan Fang, Ming Joo Koh, Jishan Wu, Pavel Jelínek, Jiong Lu, Strain-Induced Isomerization in One-Dimensional Metal–Organic Chains, ***Angewandte Chemie International Edition*** 131, 18764-18770, *2019*

List of Presentations

1. Edge structure controlled synthesis of graphene nanoribbons
S. Song, T. Nakae, T. Kojima, and H. Sakaguchi
The 2015 International Chemical Congress of Pacific Basin Societies, 2015.12.15-20, Honolulu, Hawaii, USA

2. Novel Nanographene Material Synthesized via Chemical Vapor Deposition
S. Song, T. Nakae, T. Kojima, and H. Sakaguchi
The 2nd International Symposium on Synthetic Two-Dimensional Polymers (S2DP-2), 2016.6.2-4, Nara, Japan

3. CVD Synthesis of Acene-Type Graphene Nanoribbons by Surface-Conformation-Driven Mechanism
T. Nakae, **S. Song**, T. Kojima, and H. Sakaguchi
The 2nd International Symposium on Synthetic Two-Dimensional Polymers (S2DP-2), 2016.6.2-4, Nara, Japan

4. Structure-controlled surface synthesis of molecular-width graphene nanoribbons by radical polymerization-chemical vapor deposition
S. Song, S. Fujita, T. Nakae, and H. Sakaguchi
The 95th CSJ Annual Meeting, 2015.3.26-29, Nihon University, Tokyo, Japan

5. Synthesis novel Graphene Nanoribbon via Two-Zone Chemical Vapor Deposition
T. Nakae, T. Iruka, S. Fujita, **S. Song**, H. Sakaguchi
The 95th CSJ Annual Meeting, 2015.3.26-29, Nihon University, Tokyo, Japan

6. Bottom-up On-surface Synthesis of Acene-type GNR
T. Kojima, T. Nakae, **S. Song**, M. Yano, H. Sakaguchi
26th Symposium on Physical Organic Chemistry, 2015.9.24-26, Ehime, Japan

7. Surface Synthesis of Acene-type Graphene Nanoribbon Driven by Self-Assembly of a Flexible Monomer Molecule
T. Nakae, T. Kojima, **S. Song**, M. Yano, H. Sakaguchi
6th symposium of Molecular Architectonics, 2015.10.23-24, Kyoto, Japan

8. Acene-type Graphene Nanoribbons Fabrication by Radical Polymerization-chemical vapor deposition
S. Song, T. Nakae, T. Kojima, H. Sakaguchi
6th symposium of Molecular Architectonics, 2015.10.23-24, Kyoto, Japan

9. Surface Synthesis of Acene-type Graphene Nanoribbon
T. Nakae, **S. Song**, T. Kojima, and H. Sakaguchi

50th Symposium of Fullerene, Nanotube, and Graphene, 2016.2.20-22, Tokyo, Japan

10. Direct Observation of Homochiral Polymerization-Leading Growth of Graphene Nanoribbon on Au(111) Surface
S. Song, T. Nakae, T. Kojima, and H. Sakaguchi
Institute for Chemical Research International Symposium 2016，2016.3.7-8，Kyoto, Japan

11. Novel Acene-type Graphene Nanoribbon Aynthesized from A Surface Transformable Molecule, and Its Mechanism of Polymerization and Dehydrogenation
T. Nakae, **S. Song**, T. Kojima, H. Sakaguchi
The 96th CSJ Annual Meeting, 2016.3.24-27, Kyoto, Japan

12. Synthesis of Acene-Type Graphene Nanoribbon by Surface-Induced Homochiral Polymerization
S. Song, T. Nakae, T. Kojima, H. Sakaguchi
The 96th CSJ Annual Meeting,2016.3.24-27, Kyoto, Japan

13. Surface Synthesis of Acene-type Graphene Nanoribbon
T. Nakae, T. Kojima, **S. Song**, H. Sakaguchi
7th symposium of Molecular Architectonics，2016.10.20-21, Kyushu, Japan

14. Development of a Biomimetic Catalytic Process for Acene-type GNR
T. Kojima, **S. Song**, T. Nakae, H. Sakaguchi
Scientific Research on Innovative Areas [π-system figuration: control of Electron and Sturcture Dynamism for Innovative Functions] 3rd Open Symposium, 2016.10.20-21, Sendai, Japan

15. Fabrication of Acene-Type Graphene Nanoribbons on Au(111)
S. Song, T. Kojima, T. Nakae, and H. Sakaguchi
Symposium on Surface Science and Nanotechnology Kansai，2017.1.24-25，Kyoto, Japan

16. Surface-assisted Bottom-up Synthesis of Width-controlled Graphene Nanoribbon
T. Kojima, **S. Song**, T. Nakae, H. Sakaguchi
The 97th CSJ Annual Meeting,2017.3.16-19, Tokyo, Japan

17. A study on the on-surface synthesis of novel carbon-based nanoribbon structures
S. Song
Invited seminar, by Prof. Dingyong Zhong, Department of Physics, Sun Yat-sen University, 2017.10.22-23, Guangzhou, China

18. Carbon-based Spins
S. Song
Invited seminar, by Prof. Tianwu Wang, Research Institute of AIRCAS, 2021.09.20, Guangzhou, China

19. Designer Magnetic Topological Graphene Nanoribbons
S. Song
Invited seminar, by Prof. Xudong Xiao, Department of Physics, Wuhan University, 2021.11.04-05, Wuhan, China

20. Designer Magnetic Topological Graphene Nanoribbons
S. Song, P. Ng, S. Edalatmanesh, A.Solé, X. Peng, J. Kolorenč, Z. Sosnová, O. Stetsovych, J. Su, A. Liebig, J. Wu, F. J. Giessibl, P. Jelinek, C. Chi, J. Lu.
International Workshop of On-surface Synthesis, 2022.10.25-30, Sant Feliu de Guixols, Spain.

21. On-surface Synthesis of Nitrogen-doped Zigzag-edged Graphene Nanoribbon
S. Song, Y. Teng, H. Hao, Y. He, C. Su, J. Lu.
24th non-contact atomic force microscopy conference, 2023.9. 25-30, Singapore UTown.

22. Entangled Polyradical Nanographene with Coexisting Strong Correlation and Topological Frustration
S. Song, A. P. Solé, A. Matěj, G. Li, J. Brabec, L. Veis, J. Wu, P. Jelinek, J. Lu.
International Conference of Quantum Nanoscience, 2023.10. 25-30, Seoul, South Korea.

23. Designer Magnetic Nanographene
S. Song, Y Teng, W Tang, Y He, Y Liao, Z Xu, H Sakaguchi, C Su, S Louie, J Lu.
34th Chinese Chemical Society congress, 2024. 6. 14-18, Guangzhou, China.

24. Janus Graphene Nanoribbon with a Single Ferromagnetic Zigzag edge
S. Song
Invited talk. Shenzhen University, College of Chemistry and Environmental Engineering 2024. 6. 26

25. Designer Magnetic Nanographene
S. Song, Y Teng, W Tang, Y He, Y Liao, Z Xu, H Sakaguchi, C Su, S Louie, J Lu.
25th non-contact atomic force microscopy conference, 2024. 8. 5-9. Montréal, Canada