

Tengteng Chen

Prof. Teng-Teng Chen

Assistant Professor

Department of Chemistry, the Hong Kong University of Science and Technology (HKUST)

Phone: +852-23587387

Email: tengtengchen@ust.hk; tengteng_chen@alumni.brown.edu;

Google scholar: <https://scholar.google.com/citations?user=8sKZ82kAAAAJ&hl=en>

ACADEMIC QUALIFICATIONS

2014.09-2020.05 Ph.D. in Chemistry, Brown University, Providence, RI, USA, Advisor: **Prof. Lai-Sheng Wang**

2009.08-2013.06 B.S. in Applied Physics, Special Class for Gifted Young (SCGY), University of Science and Technology of China (USTC), Hefei, Anhui, China,

PROFESSIONAL EXPERIENCE

2023.08-present **Assistant Professor**
Dept. of Chemistry, HKUST, Hong Kong

2023.08-present **Assistant Professor**
HKUST SZ-HK Collaborative Research Institute (SHCIRI)

2023.10-present **Affiliated Professor**
HKUST(Guangzhou)

2020.06-2023.06 **Postdoctoral Scholar**
Dept. of Chemistry and Biochemistry, University of California, San Diego, USA
Advisor: Prof. Wei Xiong

2014.09-2020.05 **Ph.D. Candidate**
Dept. of Chemistry, Brown University, USA
Advisor: Prof. Lai-Sheng Wang

2013.08-2014.02 **Ph.D. Candidate**
Dept. of Chemistry, University of Pennsylvania, USA

2012.09-2013.02 **Research Assistant**
Dept. of Modern Physics, USTC, China
Advisor: Prof. Jiangfeng Du

AWARDS AND HONORS

Young Elite Scientists Sponsorship Program by CAST, 2023

Chinese Government Award for Outstanding Self-Financed Students Abroad, 2021

Sigma Xi Award for Excellence in Graduate Research, 2020

RESEARCH INTEREST

Strong Light-Matter Coupling, Polariton Chemistry, Pump Probe and 2D IR Spectroscopy, Ultrafast Dynamics, Chemical Reactions, Chemical Bonding, Photoelectron Spectroscopy, Nanoclusters, Experimental Physical Chemistry

GRANTS

Current:

1. Young Elite Scientists Sponsorship Program by CAST, ¥300,000 (01/2024-01/2027)

SELECTED PUBLICATIONS

- A1 **Chen, T.-T.**; Du, M.; Yang, Z.; Yuen-Zhou, J.; Xiong, W., Cavity-enabled enhancement of ultrafast intramolecular vibrational redistribution over pseudorotation. *Science* **2022**, 378 (6621), 790-794.

Tengteng Chen

- A2 Li, W.-L.;* **Chen, T.-T.**;* Chen, W.-J.; Li, J.; Wang, L.-S., Monovalent lanthanide(I) in borozene complexes. *Nat. Commun.* **2021**, *12* (1), 6467. (* indicates the co-first authorship)
- A3 **Chen, T.-T.**; Li, W.-L.; Chen, W.-J.; Yu, X.-H.; Dong, X.-R.; Li, J.; Wang, L.-S., Spherical trihedral metallo-borosphenes. *Nat. Commun.* **2020**, *11* (1), 2766.
- A4 **Chen, T.-T.**; Cheung, L. F.; Chen, W.-J.; Cavanagh, J.; Wang, L.-S., Observation of Transition-Metal-Boron Triple Bonds in IrB_2O^- and ReB_2O^- . *Angew. Chem. Int. Ed.* **2020**, *59* (35), 15260-15265.
- A5 Li, W.-L.;* **Chen, T.-T.**;* Xing, D.-H.; Chen, X.; Li, J.; Wang, L.-S., Observation of highly stable and symmetric lanthanide octa-boron inverse sandwich complexes. *Proc. Natl. Acad. Sci. U.S.A.* **2018**, *115* (30), E6972-E6977. (* indicates the co-first authorship)
- B1 **Chen, T.-T.**; Cheung, L. F.; Wang, L.-S., Probing the Nature of the Transition-Metal-Boron Bonds and Novel Aromaticity in Small Metal-Doped Boron Clusters Using Photoelectron Spectroscopy. *Annu. Rev. Phys. Chem.* **2022**, *73* (1), 233-253.
- B2 Wang, Z.-L.;* **Chen, T.-T.**;* Chen, W.-J.; Li, W.-L.; Zhao, J.; Jiang, X.-L.; Li, J.; Wang, L.-S.; Hu, H.-S., The smallest 4f-metalla-aromatic molecule of cyclo- PrB_2^- with Pr-B multiple bonds. *Chem. Sci.* **2022**, *13* (34), 10082-10094. (* indicates the co-first authorship)
- B3 Cheung, L. F.;* **Chen, T.-T.**;* Kocheril, G. S.; Chen, W.-J.; Czekner, J.; Wang, L.-S., Observation of Four-Fold Boron-Metal Bonds in $\text{RhB}(\text{BO}^-)$ and RhB . *J. Phys. Chem. Lett.* **2020**, *11* (3), 659-663. (* indicates the co-first authorship)
C&EN in Volume 98 Issue 5, 2020, "Boron makes quadruple bond with rhodium"
RhB selected as "C&EN's molecules of the year for 2020"
- B4 **Chen, T.-T.**; Li, W.-L.; Li, J.; Wang, L.-S., $[\text{La}(\eta^x\text{-B}_x)\text{La}]^-$ ($x = 7-9$): a new class of inverse sandwich complexes. *Chem. Sci.* **2019**, *10* (8), 2534-2542.
- B5 **Chen, T.-T.**; Li, W.-L.; Jian, T.; Chen, X.; Li, J.; Wang, L.-S., PrB_7^- : A Praseodymium-Doped Boron Cluster with a Pr^{II} Center Coordinated by a Doubly Aromatic Planar $\eta^7\text{-B}_7^{3-}$ Ligand. *Angew. Chem. Int. Ed.* **2017**, *56* (24), 6916-6920.

FULL LIST OF PUBLICATIONS

- 1) **Chen, T.-T.**; Du, M.; Yang, Z.; Yuen-Zhou, J.; Xiong, W., Cavity-enabled enhancement of ultrafast intramolecular vibrational redistribution over pseudorotation. *Science* **2022**, *378* (6621), 790-794. DOI: [10.1126/science.add0276](https://doi.org/10.1126/science.add0276) (Perspective on the paper: Chuntunov, L., Using mirrors to control molecular dynamics. *Science* **2022**, *378* (6621), 712-712.)
- 2) Wang, Z.-L.*; **Chen, T.-T.**.*; Chen, W.-J.; Li, W.-L.; Zhao, J.; Jiang, X.-L.; Li, J.; Wang, L.-S.; Hu, H.-S., The smallest 4f-metalla-aromatic molecule of cyclo- PrB_2^- with Pr-B multiple bonds. *Chem. Sci.* **2022**, *13* (34), 10082-10094. (* indicates the co-first authorship)
- 3) Chen, W.-J.*; **Chen, T.-T.**.*; Chen, Q.*; Lu, H.-G.; Zhao, X.-Y.; Ma, Y.-Y.; Yan, Q.-Q.; Yuan, R.-N.; Li, S.-D.; Wang, L.-S., Boron-lead multiple bonds in the PbB_2O^- and PbB_3O_2^- clusters. *Commun. Chem.* **2022**, *5* (1), 25. (* indicates the co-first authorship)
- 4) **Chen, T.-T.**; Cheung, L. F.; Wang, L.-S., Probing the Nature of the Transition-Metal-Boron Bonds and Novel Aromaticity in Small Metal-Doped Boron Clusters Using Photoelectron Spectroscopy. *Annu. Rev. Phys. Chem.* **2022**, *73* (1), 233-253.
- 5) Li, W.-L.*; **Chen, T.-T.**.*; Chen, W.-J.; Li, J.; Wang, L.-S., Monovalent lanthanide(I) in borozene complexes. *Nat. Commun.* **2021**, *12* (1), 6467. (* indicates the co-first authorship)
- 6) Tian, W.-J.; Chen, W.-J.; Yan, M.; Li, R.; Wei, Z.-H.; **Chen, T.-T.**; Chen, Q.; Zhai, H.-J.; Li, S.-D.; Wang, L.-S., Transition-metal-like bonding behaviors of a boron atom in a boron-cluster boronyl complex $[(\eta^7\text{-B}_7)\text{-B-BO}]^-$. *Chem. Sci.* **2021**, *12* (23), 8157-8164.
- 7) Jiang, Z.-Y.*; **Chen, T.-T.**.*; Chen, W.-J.; Li, W.-L.; Li, J.; Wang, L.-S., Expanded Inverse-Sandwich Complexes of Lanthanum Borides: $\text{La}_2\text{B}_{10}^-$ and $\text{La}_2\text{B}_{11}^-$. *J. Phys. Chem. A* **2021**, *125* (12), 2622-2630. (* indicates the co-first authorship)
- 8) Chen, W.-J.; Ma, Y.-Y.; **Chen, T.-T.**; Ao, M.-Z.; Yuan, D.-F.; Chen, Q.; Tian, X.-X.; Mu, Y. W.; Li, S.-D.; Wang, L.-S., B_{48}^- : a bilayer boron cluster. *Nanoscale* **2021**, *13* (6), 3868-3876.
- 9) Li, W.-L.; **Chen, T.-T.**; Jiang, Z.-Y.; Wang, L.-S.; Li, J., Recent Progresses in the Investigation of Rare-earth Boron Inverse Sandwich Clusters. *Chin. J. Struct. Chem.*, **2020**, *39* (6), 1009-1018.
- 10) **Chen, T.-T.**; Cheung, L. F.; Chen, W.-J.; Cavanagh, J.; Wang, L.-S., Observation of Transition-Metal Boron Triple Bonds in IrB_2O^- and ReB_2O^- . *Angew. Chem. Int. Ed.* **2020**, *59* (35), 15260-15265.
- 11) **Chen, T.-T.**; Li, W.-L.; Chen, W.-J.; Yu, X.-H.; Dong, X.-R.; Li, J.; Wang, L.-S., Spherical Trihedral Metallo-Borosphenes. *Nat. Commun.* **2020**, *11* (1), 2766.
- 12) Cheung, L. F.*; **Chen, T.-T.**.*; Kocheril, G. S.; Chen, W.-J.; Czekner, J.; Wang, L.-S., Observation of Fourfold Boron-Metal Bonds in $\text{RhB}(\text{BO}^-)$ and RhB . *J. Phys. Chem. Lett.* **2020**, *11* (3), 659-663. (* indicates the co-first authorship)
C&EN in Volume 98 Issue 5, 2020, "Boron makes quadruple bond with rhodium"
RhB selected as "C&EN's molecules of the year for 2020"

Tengteng Chen

- 13) Bai, H.*; **Chen, T.-T.***; Chen, Q.*; Zhao, X.-Y.; Zhang, Y.-Y.; Chen, W.-J.; Li, W.-L.; Cheung, L. F.; Bai, B.; Cavanagh, J.; Huang, W.; Li, S.-D.; Li, J.; Wang, L.-S., Planar B_{41}^- and B_{42}^- Clusters with Double-Hexagonal Vacancies. *Nanoscale* **2019**, *11* (48), 23286-23295. (* indicates the co-first authorship)
- 14) **Chen, T.-T.**; Li, W.-L.; Chen, W.-J.; Li, J.; Wang, L.-S., $La_3B_{14}^-$: An Inverse Triple-Decker Lanthanide Boron Cluster. *Chem. Commun.* **2019**, *55* (54), 7864-7867.
- 15) **Chen, T.-T.**; Li, W.-L.; Bai, H.; Chen, W.-J.; Dong, X.-R.; Li, J.; Wang, L.-S., $Re@B_8^-$ and $Re@B_9^-$: New Members of the Transition-Metal-Centered Borometallic Molecular Wheel Family. *J. Phys. Chem. A* **2019**, *123* (25), 5317-5324.
- 16) Chen, Q.*; **Chen, T.-T.***; Li, H.-R.; Zhao, X.-Y.; Chen, W.-J.; Zhai, H.-J.; Li, S.-D.; Wang, L.-S., B_{31}^- and B_{32}^- : Chiral Quasi-Planar Boron Clusters. *Nanoscale* **2019**, *11*, 9698-9704. (* indicates the co-first authorship)
- 17) Li, W.-L.*; **Chen, T.-T.***; Jiang, Z.-Y.; Chen, W.-J.; Hu, H.-S.; Wang, L.-S.; Li, J., Probing the Electronic Structure of the CoB_{16}^- Drum Complex: Unusual Oxidation State of Co(-I). *Chin. J. Chem. Phys.* **2019**, *31* (2), 241-247. (* indicates the co-first authorship)
- 18) **Chen, T.-T.**; Li, W.-L.; Li, J.; Wang, L.-S., $[La(\eta^x-B_x)La]^-$ ($x = 7-9$): A New Class of Inverse Sandwich Complexes. *Chem. Sci.* **2019**, *10*, 2534-2542.
- 19) Chen, X.*; **Chen, T.-T.***; Li, W.-L.; Lu, J.-B.; Zhao, L.-J.; Jian, T.; Hu, H.-S.; Wang, L.-S.; Li, J., Lanthanides with Unusually Low Oxidation States in the PrB_3^- and PrB_4^- Boride Clusters. *Inorg. Chem.* **2019**, *58* (1), 411-418. (* indicates the co-first authorship)
- 20) Jian, T.; Cheung, L. F.; **Chen, T.-T.**; Lopez, G. V.; Li, W.-L.; Wang, L.-S., Di-Niobium Gold Clusters: Multiply-Bonded Nb_2 Dimer Coordinated Equatorially by Au Atoms. *Int. J. Mass Spectrom.* **2018**, *434*, 7-16.
- 21) Li, W.-L.*; **Chen, T.-T.***; Xing, D.-H.; Chen, X.; Li, J.; Wang, L.-S., Observation of Highly Stable and Symmetric Lanthanide Octa-Boron Inverse Sandwich Complexes. *Proc. Natl. Acad. Sci. U.S.A.* **2018**, *115* (30), E6972-E6977. (* indicates the co-first authorship)
- 22) Li, W.-L.; Hu, H.-S.; Zhao, Y.-F.; Chen, X.; **Chen, T.-T.**; Jian, T.; Wang, L.-S.; Li, J., Recent Progress on the Investigations of Boron Clusters and Boron-Based Materials (I): Borophene. *SCI. SINICA CHIMICA* **2018**, *48* (2), 98-107.
- 23) Li, W.-L.; Chen, X.; Jian, T.; **Chen, T.-T.**; Li, J.; Wang, L.-S., From Planar Boron Clusters to Borophenes and Metalloborophenes. *Nat. Rev. Chem.* **2017**, *1* (10), 0071.
- 24) **Chen, T.-T.**; Li, W.-L.; Jian, T.; Chen, X.; Li, J.; Wang, L.-S., PrB_7^- : A Praseodymium-Doped Boron Cluster with a Pr^{II} Center Coordinated by a Doubly Aromatic Planar $\eta^7-B_7^{3-}$ Ligand. *Angew. Chem. Int. Ed.* **2017**, *56* (24), 6916-6920.
- 25) Jian, T.; Cheung, L. F.; Czekner, J.; **Chen, T.-T.**; Lopez, G. V.; Li, W.-L.; Wang, L.-S., $Nb_2@Au_6$: A Molecular Wheel with a Short $Nb=Nb$ Triple Bond Coordinated by an Au_6 Ring and Reinforced by σ Aromaticity. *Chem. Sci.* **2017**, *8* (11), 7528-7536.
Highlighted by ChemistryWorld, "Chemists reinvent the wheel"
- 26) Jian, T.; Cheung, L. F.; **Chen, T.-T.**; Wang, L.-S., Bismuth-Boron Multiple Bonding in BiB_2O^- and Bi_2B^- . *Angew. Chem. Int. Ed.* **2017**, *56* (32), 9551-9555.
- 27) Li, W.-L.; Jian, T.; Chen, X.; Li, H.-R.; **Chen, T.-T.**; Luo, X.-M.; Li, S.-D.; Li, J.; Wang, L.-S., Observation of a Metal-Centered $B_2-Ta@B_{18}^-$ Tubular Molecular Rotor and a Perfect $Ta@B_{20}^-$ Boron Drum with the Record Coordination Number of Twenty. *Chem. Commun.* **2017**, *53* (10), 1587-1590.
Featured on inside front cover of Chem. Commun.
- 28) Jian, T.; Li, W.-L.; Chen, X.; **Chen, T.-T.**; Lopez, G. V.; Li, J.; Wang, L.-S., Competition between Drum and Quasi-Planar Structures in RhB_{18}^- : Motifs for Metallo-Boronanotubes and Metallo-Borophenes. *Chem. Sci.* **2016**, *7* (12), 7020-7027.
- 29) Li, W.-L.; Jian, T.; Chen, X.; **Chen, T.-T.**; Lopez, G. V.; Li, J.; Wang, L.-S., The Planar CoB_{18}^- Cluster as a Motif for Metallo-Borophenes. *Angew. Chem. Int. Ed.* **2016**, *26* (55), 7358-7363.
Featured on the Frontispiece of Angew. Chem. Int. Ed.
Editor's highlight in Nano Res. 9, 1877-1878 (2016)
- 30) Li, W.-L.; Liu, H.-T.; Jian, T.; Lopez, G. V.; Piazza, Z. A.; Huang, D.-L.; **Chen, T.-T.**; Su, J.; Yang, P.; Chen, X.; Wang, L.-S.; Li, J., Bond-Bending Isomerism of $Au_2I_3^-$: Competition between Covalent Bonding and Auophilicity. *Chem. Sci.* **2016**, *7* (1), 475-481.
Highlighted by ChemistryWorld, "Gold cluster bends between two isomers"

RESEARCH PRESENTATION

-Invited talks: Dept. of Chemistry at Tsinghua University (11/2023), Dept. of Chemistry at SUSTech (10/2023), HFNL at USTC (07/2023), School of Chemical Science and Engineering at Tongji University (06/2023), Telluride Workshop: *Polariton Chemistry and Molecular Cavity Quantum Electrodynamics* (06/2023), APS March Meeting (03/2023), ACS Spring Meeting (03/2022)

SERVICE

Members, American Chemical Society, American Physical Society, Chinese Chemical Society, Brown University Alumni Association of Hong Kong.