ANUVAB DAS

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EDUCATION

Texas A&M University — College Station, TX
Ph.D. in Chemistry — Dec 2020

Indian Institute of Technology Kharagpur — Kharagpur, India
M.Sc. in Chemistry — Aug 2015

Presidency College, University of Calcutta — Kolkata, India
B.Sc. (Honors) in Chemistry (minor in Physics and Mathematics) — May 2013

RESEARCH EXPERIENCE

Postdoctoral Research Scholar, California Institute of Technology — Pasadena, CA
Advisor: Prof. Frances H. Arnold — Dec 2020–June 2024
Project: Engineering Enzymes to Perform Novel C–H Functionalization Reactions and Discovery of New Aminating Reagents

Graduate Research Assistant, Texas A&M University — College Station, TX
Advisor: Prof. David C. Powers — Oct 2015–Dec 2020
Thesis: Crystallographic Characterization of Transient C–H Amination Intermediates

Graduate Research Assistant, Indian Institute of Technology Kharagpur — Kharagpur, India
Advisor: Prof. Jayanta K. Ray — May 2014–April 2015
Thesis: Pd-Catalyzed Annulation of Internal Alkynes for the Synthesis of Fulvene and Indene Derivatives

Summer Undergraduate Research Fellow, Indian Association for the Cultivation of Science — Kolkata, India
Advisor: Prof. Abhishek Dey — May 2013–July 2013
Project: Absorption and Electrochemical Investigation of Ligand Binding Study of N-donor Ligands to Zn-Porphyrins in Non-Aqueous Media

AWARDS & HONORS

2023 Merck Underrepresented Chemists of Color Award Finalist — 2023
Dr. Judith Edmiston Mentoring Award — 2020
70th Lindau Nobel Laureate Meeting Participant — 2020
2020 Reaxys PhD Prize Finalist — 2020
Martin Donald Corera Memorial Endowed Fund — 2019

PUBLICATIONS *(† = equal contributions; Name = undergraduate co-author)*

At Caltech

22. **Das, A.**;† Gao, S.;† Lal, R. G.; Hicks, M. H.; Oyala, P. H.; Arnold, F. H. Reaction Discovery Using Spectroscopic Insights from an Enzymatic C–H Amination Intermediate. *J. Am. Chem. Soc.* **2024**, *146*, 20556–20562. DOI: 10.1021/jacs.4c05761.
21. Mao, R.;† Gao, S.;† Qin, Z.-Y.;† Rogge, T.; Wu, S. J.; Li, Z.-Q.; **Das, A.**; Houk, K. N.; Arnold, F. H. Biocatalytic, Enantioenriched Primary Amination of Tertiary C–H Bonds. *Nat. Catal.* **2024**, *7*, 585–592. DOI: 10.1038/s41929-024-01149-w.
20. Wackelin, D. J.;† Mao, R.;† Sicinski, K. M.; Zhao, Y.; **Das, A.**; Chen, K.; Arnold, F. H. Enzymatic Assembly of Diverse Lactone Structures: An Intramolecular C–H Functionalization Strategy. *J. Am. Chem. Soc.* **2024**, *146*, 1580–1587. DOI: 10.1021/jacs.3c11722.
19. **Das, A.**;† Long, Y.;† Maar, R. R.; Roberts, J. M.; Arnold, F. H. Expanding Biocatalysis for Organosilane Functionalization: Enantioselective Nitrene Transfer to Benzylic Si–C–H Bonds. *ACS Catal.* **2024**, *14*, 148–152. DOI: 10.1021/acscatal.3c05370. (**Selected** for ACS Editor's Choice.)
18. **Das, A.**; Gao, S.; Athavale, S. V.; Alfonzo, E.; Long, Y.; Arnold, F. H. Directed Evolution of P411 Enzymes for Amination of Inert C–H Bonds. *Methods Enzymol.* **2023**, *693*, 1–30. DOI: 10.1016/bs.mie.2023.09.009.
17. Gao, S.; **Das, A.**; Alfonzo, E.; Sicinski, K. M.; Rieger, D.; Arnold, F. H. Enzymatic Nitrogen Incorporation Using Hydroxylamine. *J. Am. Chem. Soc.* **2023**, *145*, 20196–20201. DOI: 10.1021/jacs.3c08053.
16. Paikar, A.; Van Trieste III, G. P.; **Das, A.**; Wang, C.-W.; Sill, T. E.; Bhuvanesh, N.; Powers, D. C. Development of Non-Classical Photoprecursors for Rh_2 Nitrenes. *Inorg. Chem.* **2023**, *62*, 12557–12564. DOI: 10.1021/acs.inorgchem.3c01820.
15. Mao, R.;† Wackelin, D. J.;† Jamieson, C. S.; Rogge, T.; Gao, S.; **Das, A.**; Taylor, D. M.; Houk, K. N.; Arnold, F. H. Enantio- and Diastereoenriched Enzymatic Synthesis of 1,2,3-Polysubstituted Cyclopropanes from (Z/E)-Trisubstituted Enol Acetates. *J. Am. Chem. Soc.* **2023**, *145*, 16176–16185. DOI: 10.1021/jacs.3c04870.
14. Schaus, L.;† **Das, A.**;† Knight, A. M.; Jimenez-Osés, G.; Houk, K. N.; Garcia-Borràs, M.; Arnold, F. H.; Huang, X. Protoglobin-catalyzed formation of *cis*-trifluoromethyl-substituted cyclopropanes via carbene transfer. *Angew. Chem. Int. Ed.* **2023**, *62*, e202208936. DOI: 10.1002/anie.202208936.
13. Athavale, S. V.;† Gao, S.;† **Das, A.**;† Mallojjala, S. C.; Alfonzo, E.; Long, Y.; Hirschi, J. S.; Arnold, F. H. Enzymatic Nitrogen Insertion into Unactivated C–H Bonds. *J. Am. Chem. Soc.* **2022**, *144*, 19097–19105. DOI: 10.1021/jacs.2c08285. (**Perspective** by Derek Lowe 'Zapping In Amine Groups' in Science magazine. **Highlight** in *Synfacts* **2023**, *19*, 81.)
12. Alfonzo, E.; **Das, A.**; Arnold, F. H. New Additions to the Arsenal of Biocatalysts for Non-canonical Amino Acid Synthesis. *Curr. Opin. Green Sustain. Chem.* **2022**, *38*, 100701. DOI: 10.1016/j.cogsc.2022.100701.

At Texas A&M

11. Van Trieste III, G. P.; Reid, K. A.; Hicks, M. H.; **Das, A.**; Figgins, M. T.; Bhuvanesh, N.; Ozarowski, A.; Telser, J.; Powers, D. C. Nitrene Photochemistry of Manganese *N*-Haloamides. *Angew. Chem. Int. Ed.* **2021**, *60*, 26647–26655. DOI: 10.1002/anie.202108304.
10. Dau, H.; Keyes, A.; Basbug Alhan, H. E.; Ordonez, E.; Tsogtgerel, E.; Gies, A. P.; Auyeung, E.; Zhou, Z.; Maity, A.; **Das, A.**; Powers, D. C.; Beezer, D. B.; Harth, E. Dual Polymerization Pathway for Polyolefin-Polar Block Copolymer Synthesis via MILRad: Mechanism and Scope. *J. Am. Chem. Soc.* **2020**, *142*, 21469–21483. DOI: 10.1021/jacs.0c10588.
9. **Das, A.**; Wang, C.-H.; Van Trieste III, G. P.; Sun, C.-J.; Chen, Y.-S.; Reibenspies, J. H.; Powers, D. C. *In Crystallo* Snapshots of Rh_2 Catalyzed C–H Amination. *J. Am. Chem. Soc.* **2020**, *142*, 19862–19867. DOI: 10.1021/jacs.0c09842. (**Highlight** in *Nat. Rev. Chem.* **2021**, *5*, 2.)
8. Baek, Y.; **Das, A.**; Zheng, S.-L.; Reibenspies, J. H.; Powers, D. C.; Betley, T. A. C–H Amination Mediated by Cobalt Organoazide Adducts and the Corresponding Cobalt Nitrenoid Intermediates. *J. Am. Chem. Soc.* **2020**, *142*, 11232–11243. DOI: 10.1021/jacs.0c04252.

7. Hyun, S.-M.; Upadhyay, A.; **Das, A.**; Burns, C. P.; Sung, S.; Beaty, J. D.; Bhuvanesh, N.; Nippe, M.; Powers, D. C. Kinetic versus Thermodynamic Metalation enables Synthesis of Isostructural Homo- and Heterometallic Trinuclear Clusters. *Chem. Commun.* **2020**, *56*, 5893–5896. DOI: 10.1039/D0CC02346A.
6. **Das, A.**; Van Trieste III, G. P.; Powers, D. C. Crystallography of Reactive Intermediates. *Comment Inorg. Chem.* **2020**, *40*, 116–158. DOI: 10.1080/02603594.2020.1747054.
5. **Das, A.**; Chen, Y.-S.; Reibenspies, J. H.; Powers, D. C. Characterization of a Reactive Rh_2 Nitrenoid by Crystalline Matrix Isolation. *J. Am. Chem. Soc.* **2019**, *141*, 16232–16236. DOI: 10.1021/jacs.9b09064.
4. **Das, A.**; Maher, A. G.; Telser, J.; Powers, D. C. Observation of a Photogenerated Rh_2 Nitrenoid Intermediate in C–H Amination. *J. Am. Chem. Soc.* **2018**, *140*, 10412–10415. DOI: 10.1021/jacs.8b05599.
3. Wang, C.-H.; **Das, A.**; Gao, W.-Y.; Powers, D. C. Probing Substrate Diffusion in Interstitial MOF Chemistry with Kinetic Isotope Effects. *Angew. Chem. Int. Ed.* **2018**, *57*, 3676–3681. DOI: 10.1002/anie.201713244.
2. **Das, A.**; Reibenspies, J. H.; Chen, Y.-S.; Powers, D. C. Direct Characterization of a Reactive Ru_2 Nitride by Photocrystallography. *J. Am. Chem. Soc.* **2017**, *139*, 2912–2915. DOI: 10.1021/jacs.6b13357.

At IIT Kharagpur

1. Dhara S.; Singha R.; Ghosh M.; Ahmed A.; Nuree Y.; **Das A.**; Ray J. K. Pd-free Sonogashira coupling: one pot synthesis of phthalide *via* domino Sonogashira coupling and 5-*exo-dig* cyclization. *RSC Adv.* **2014**, *4*, 42604–42607. DOI: 10.1039/C4RA07639G.

RESEARCH PRESENTATIONS

Gordon Research Conference: Enzymes, Coenzymes and Metabolic Pathways Waterville Valley, NH	July 2023
Gordon Research Conference: Biocatalysis Manchester, NH	July 2022
71st Lindau Nobel Laureate Meeting (Chemistry) Lindau, Germany	June 2022
Tata Institute of Fundamental Research: Future of Chemistry Symposium Mumbai, India (Online)	Aug 2021
70th Lindau Nobel Laureate Meeting (Interdisciplinary) Lindau, Germany (Online)	June 2020
3rd Symposium of Metal–Carbene Consortium San Antonio, TX	Feb 2020
Gordon Research Conference: Inorganic Reaction Mechanisms Galveston, TX	Mar 2019
Dow Symposium College Station, TX	May 2018
F. A. Cotton Symposium College Station, TX	Mar 2017
A. E. Martell Symposium College Station, TX	Oct 2016

LEADERSHIP & VOLUNTEERING

Industry Liaison, *Organization for Cultural Diversity in Chemistry*	2019–2020
Chemistry Senator, *Graduate and Professional Student Government*	2018–2019
International Liaison, *Graduate Student Association of Chemistry*	2018–2019
Safety Officer for Inorganic Division, *Chemistry Student Safety Committee*	2018–2019
Member, *American Chemical Society*	2017–Present
Peer-Reviewer, *ACS Catal., Inorg. Chem., Tetrahedron, Angew. Chem. Int. Ed.*	2020–Present

TEACHING EXPERIENCE

Graduate Teaching Assistant, Texas A&M University — Sept 2015–April 2020

General Chemistry Laboratory (CHEM 112)
Organic Laboratory (CHEM 237)
Organic Laboratory (CHEM 238)
Advanced Inorganic Laboratory (CHEM 433)

MENTORING EXPERIENCE

Texas A&M University

Mentored Undergraduate Students
Brianna Lilly (currently at PepsiCo)
Ryan Wise (graduate student at University of Florida)
Madeline Hicks (graduate student at Caltech)
Ryan Burk (undergraduate student at Texas A&M University)

Mentored Graduate Student
Dr. Gerard Pierre van Trieste III (currently at Intel)

California Institute of Technology

Mentored Graduate Student
Dr. Shilong Gao (currently at Moderna)
Yueming Long (graduate student at Caltech)

Mentored Postdoctoral Scholar
Dr. Kathleen M. Sicinski (postdoc at Caltech)

REFERENCES

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