Curriculum Vitae

Adinarayana Doddi, MSc, PhD
Assistant Professor, Department of Chemical Sciences
Indian Institute of Science Education and Research (IISER) Berhampur
Transit Campus, Industrial Training Institute (ITI)
Engineering School Road
760010, Ganjam District, Odisha
Email: adinarayanadoddi@gmail.com (or) adoddi@iiserbpr.ac.in
ORCID ID: 0000-0003-1803-4818

Research Interests

- **Advanced Main Group, Transition Metal Organometallic Chemistry and Sustainable Homogeneous Catalysis**
- **Frustrated Lewis Acid Base Pairs/Applications in Expensive Metal Free Catalysis**
- **Designing of new Ligand Scaffolds/Cooperative Catalytic Applications of Bimetallic Complexes**
- **Structure & Bonding Aspects of Metal–Metal Bonded Species of MGs and TMs**

Educational Qualifications

Ph.D Dr. rer. nat in Chemistry)
PhD in **synthetic organometallics** at the chair of inorganic chemistry-II at Ruhr University Bochum, Germany (Supervisor: Prof. Dr. Roland A Fischer, Vice President of the German Research Foundation, (DFG), Academic Director, Catalysis Research Centre, Technical University Munich, Germany)

Title of the thesis: *Synthesis and structures of low-valent gallium (I) supported organometallic compounds and new organometallic routes to intermetallic nickel-gallium nanoparticles*

2nd Master Thesis (equivalent to Diploma Thesis in Germany)

Institute for inorganic chemistry, Rheinische Friedrich-Wilhelms-University Bonn, Germany (supervisor, Prof. Dr. Rainer Streubel; Title of the thesis: *Synthesis, structural characterization and Li/Cl exchange reactions of bulky dichloro(organo)phosphine complexes of Mn and Fe carbonyls*

Masters in Chemistry (M.Sc)
Master of Science in Chemistry from Indian Institute of Technology Madras, Chennai, India

Title of M.Sc thesis: *Cationic and neutral hypervalent silicon systems-synthesis and characterization*

Bachelor of Science (B.Sc)
Bachelor of Science at A. M. A. L. College (Affiliated to Andhra University, Visakhapatnam, India)

Intermediate (10+2) Mathematics-Physics-Chemistry, City Public College, Anakapalle, AP, India

10th Standard 10th standard (SSC), Z. P. H. School, Munagapaka, Andhra Pradesh

Scientific Career and Employment Details

Visiting Faculty
Ramanujan Fellow
(Since January 2019) Department of Chemical Sciences, IISER Berhampur, Odisha, India

Sub-Group Leader/Postdoctoral Research Scientist

(04/2016-01/2019) In the research group of Prof. Dr. Matthias Tamm, TU Braunschweig, Germany

Postdoctoral Research Scientist

(04/2013-04/2016) Postdoctoral Research Fellow in the group of Prof. Dr. Matthias Tamm at Technical University Braunschweig, Germany

Field of research; Designing of novel low-valent phosphorus based main-group compounds and their use as new efficient ligands in organometallic chemistry/homogeneous catalysis

Research Assistant

Department of Chemistry, Indian Institute of Technology-Madras, Chennai, India

Junior Research Fellow

A joint project work by Heavy Water Board, Dept. of Atomic Energy, India

Title of the project: *Synthesis and characterization of derivatives of poly (dichlorophosphazene) for extraction of Uranium from phosphoric acid*

List of Publications

24. **Lewis Bases Supported Stable Cationic Os and Ir Complexes Featuring N-heterocyclic Carbene Phosphenidenide Moiety**

A. Doddi, D. Bockfeld, T. Bannenberg and M. Tamm

To be submitted soon

23. **Isolation of Carbene-Stabilized Arsenic Monophosphide [AsP] and its Radical Cation [AsP]+• and Dication [AsP]2+"**

A. Doddi, D. Bockfeld, T. Bannenberg, Marc-Kevin Zaretzke and M. Tamm., *Submitted*

22. **N-heterocyclic Carbene Supported Main-Group Adducts and their use as Ligands in Transition Metal Chemistry (An Invited Review Article in Chemical Reviews)**

A. Doddi, M. Peters and M. Tamm

Chem. Rev. **2019**, *119*, 6994-7112 (Impact factor. 52.6).

21. **Synthesis and Structures of Rh(I) and Ir(I) Complexes Supported by N-Heterocyclic Carbene-Phosphinidene Adducts**

A. Doddi,* D. Bockfeld, M. Tamm (*as corresponding cum first author)

Z. Anorg. Allg. Chem. **2019**, *645*, 44-49 (IF; 1.17).

20. **A Modular Approach to Carbene-Stabilized Diphosphorus Species**

A. Doddi, T. Bannenberg, D. Bockfeld, M. K. Zaretzke and M. Tamm

Dalton Trans., **2017**, ***46***, 15859-15864 (IF; 4.029, No of citations; 5).

19. **N-Heterocyclic Carbene-Stabilised Arsinidene (AsH)**

A. Doddi, M. Weinhart, A. Hinz, D. Bockfeld, J. M. Goicoechea, M. Scheer and M. Tamm

Chem. Comm., **2017**, *53*, 6069-6072 (IF; 6.290, No of citations; 19)

Featured on cover

18. **N-heterocyclic Carbene-Phosphinidene and Carbene-Phopshinidenide Transition Metal Complexes**

M. Peters[#], **A. Doddi**, [#] T. Bannenburg, M. Freytag, P. G. Jones and M. Tamm

Inorg. Chem., **2017**, *56*, 10785-10793.(IF; 4.88, no of citations; 4). # Both authors equally contributed

17. **Transition Metal Carbonyl Complexes and Electron Donating Properties of N heterocyclic Carbene-Phosphinidene Adducts**

D. Bockfeld, **A. Doddi**, P. G. Jones and M. Tamm

Eur. J. Inorg. Chem. **2016**, 3704–3712.

Selected for the cover picture and cover profile of the issue (IF; 2.44, No of citations;14).

16. **N-Heterocyclic Carbene-Phosphinidene Complexes of the Coinage Metals**

A. Doddi, D. Bockfeld, A. Nasr, P. G. Jones and M. Tamm

Chem. Eur. J. **2015**, *21*, 16178-16189. (IF; 5.31, No. of citations; 23).

15. **N-Heterocyclic Carbene Phosphinidyne Transition Metal Complexes**

A. Doddi, D. Bockfeld, T. Bannenburg, Peter. G. Jones and M. Tamm

Angew. Chem. Int. Ed. **2014**, *53,* 13568–1357; ***Angew. Chem.*** **2014**, *126*, 13786-13790 (IF;12.102, No. of citations; 55).

Highlight in Nachrichten aus der Chemie

(Monthly Science Magazine in Germany), 63, March 2015, P 243

14. **Low Valent Ge_2 and Ge_4 Species Trapped by N-Heterocyclic Gallylene**

A. Doddi, C. Gemel, M. Winter, R. A. Fischer, C. Goedecke,H. S. Rezpa, G. Frenking

Angew. Chem. Int. Ed. **2013**, *52,* 450-454; ***Angew. Chem.*** **2013**, *125,* 468-472 (IF; 12.102, No. of citations; 31).

13. **Colloidal Nickel/Gallium Nano alloys obtained from Organometallic Precursors in Conventional organic Solvents and in ionic liquids: Noble-metal-free Alkyne Semi hydrogenation Catalysts**

K. Schütte, **A. Doddi**, C. Kroll, H. Meyer, C. Wiktor, C. Gemel, G. V. Tendeloo, R. A. Fischer, C. Janiak

Nanoscale, **2014**, *6*, 5532-5544 (IF; 7.22, No. of citations; 33).

12. **N-Heterocyclic Gallylene Supported Organoruthenium Derivatives: Synthesis, Structure and C–H bond Cleavage**

A. Doddi, G. Prabusankar, C. Gemel, M. Winter and R. A. Fischer

Eur. J. Inorg. Chem. **2013**, 3601-3615 (IF; 2.44, No. of citations; 2).

11. **Coordination Complexes of TiX_4 (X = F, Cl) with Sterically Bulky N-heterocyclic Carbene: Syntheses, Characterization and Molecular Structures**

A. Doddi, C. Gemel, R. W. Seidel, M. Winter and R. A. Fischer

Polyhedron **2013**, *52*, 1103-1108 (IF; 2.06, No. of citations; 14).

10. **Synthesis and Characterization of Dianionic hexacoordinate Silicon (IV) Complexes of Substituted Catechols, Flavones and Fluorone: X-ray Crystal Structures of $[(n\text{-}C_3H_7)_2NH_2)]_2[(Cl_4C_6O_2)_3Si].3CH_3CN$and $[(n\text{-}C_3H_7)_2NH_2)]_2[(Br_4C_6O_2)_3Si].2(CH_3)_2SO$**

A. Doddi, J. V. Kingston, V. Ramkumar, M. Suzuki, M. Hojo, M. N. Sudheendra Rao

Phosphorus, Sulfur, and Silicon and the Related Elements. **2012**, *187(3)*, 342-356 (IF; 0.674).

9. **Synthesis and Structure of New Compounds with Pt–Ga Bonds: Insertion of the bulky Gallium (I) Bisimidinate Ga(DDP) into Pt–Cl bond**

A. Doddi, C. Gemel, R. W. Seidel, M. Winter and R. A. Fischer

***J. Organomet. Chem.* 2011**,*696*, 2635-2640 (IF; 2.17, No. of citations; 3).

8. **P–P Bond Activation of P_4 Tetrahedron by Group 13 Carbenoid and its Bis Molybdenum Pentacarbonyl Adduct**

   G. Prabusankar, **A. Doddi**, C. Gemel, M. Winter and R. A. Fischer

   ***Inorg. Chem*. 2010**, *49*, 7976–7980 (IF; 4.70, No. of citations 34).

7. **Linear Coinage Metal Complexes Stabilized by a Group 13 Metalloid Ligand**

   G. Prabusankar, S. G. Gallardo, **A. Doddi**, C. Gemel, M. Winter and R. A. Fischer

   ***Eur. J. Inorg. Chem.* 2010**, 4415–4418 (IF; 2.94, No. of citations 7).

6. **Synthesis and characterization of aminophosphine derivatives of Molybdenum hexacarbonyl. X-ray structure determination of $Mo(CO)_5(C_5H_{10}N)_3P$, $Mo(CO)_5\{Ph(OC_4H_8N)_2P\}$ and $Mo(CO)_5\{Ph[(i\text{-}C_3H_7)_2N][OC_4H_8N]P\}$**

   A. Luiz. T, **A. Doddi**, B. Varghese and M. N. Sudheendra Rao

   ***Transition Met. Chem.* 2008**, *33(6)*, 745-750 (IF; 1.358, No. of citations; 2).

5. **Cis-bis[(benzyl)(methyl)(phenyl)phosphine]tetra(carbonyl)molybdenum(0)**

   A. Doddi,T. A. Luiz, V. Ramkumar and M. N. Sudheendra Rao

   ***Acta Cryst.* 2007**, *E63*, m 2727 (IF; 0.347, No. of citations-1).

4. **Dicyclohexylamino)(Phenyl)(Piperdino)phosphine**

   A. Luiz. T, **A. Doddi**, B. Varghese and M. N. Sudheendra Rao

   ***Acta Cryst.* 2007**, *E63*, o3449(IF; 0.347).

3. **r-2,c-6-Bis(4-bromophenyl)-t-3,t-5-dimethyltetrahydropyran-4-one**

   P. Parthiban, M. Umamaheswari, **A. Doddi**, V. Ramkumar, S. Kabilan

   ***Acta Cryst.* 2007**, *E63*, o4373(IF; 0.347, No. of citations; 1).

2. **r-2,c-6-Bis(m-fluorophenyl)t-3,t-5-dimethylpiperidin-4-one**

   S. Ramachandran, P. Parthiban, **A. Doddi**, V. Ramkumar, S. Kabilan

   ***Acta Cryst*. 2007**, *E63*, o4559(IF; 0.347, No. of citations; 4).

1. **A new synthetic route to cyclophosphadithiatriazenes: synthesis and X-ray structural characterization of the first spirocycle containing thiadiazaphosphetidine and phosphadithiatriazene heterocycles**

   J. Gopalakrishna, B. Varghese B, **A. Doddi**, M. N. Sudheendra Rao

   ***Appl. Organometal. Chem*. 2006**, *20 (12)*, 880-885 (IF; 2.248, No. of citations-6).

Book Chapter

Contributed to a book chapter in titled **"Experiments in Green and Sustainable Chemistry**" Edited by H. W. Roesky and D. K. Kennepohl, Jean-Marie Lehn, WILEY-VCH, **2009**:

Title of the chapter; ***Encapsulated silicon in hypervalent Coordination-Synthesis and synthetic transformations***, *p* 149-157.

A. Doddi and M. N. Sudheendra Rao

Manuscripts in Preparation

MP1) Stabilization and isolation of novel N-heterocyclic carbene-phosphinidenide supported new germylenes, stannylenes and plumbylenes and their cationic derivatives (submission planned for *Chem. Eur. J*)

A. Doddi, D. Bockfeld, T. Bannenburg, P. G. Jones and M. Tamm.

MP2) Copper and Silver (I) complexes of N-heterocyclic Carbene-Parent Phosphinidene Adduct

A. Doddi, M. Peters, D. Bockfeld and M. Tamm (submission planned for Dalton Transactions)

MP3) First Carbene-arsinidinide and parent carbene arsinidene transition metal complexes
A. Doddi and M. Tamm (in preparation)

Prestigious Fellowships

- ✓ Ramanujan Fellowship-**2019** by SERB, Department of Science and Technology, Government of India
- ✓ 2nd time secured a travel fellowship by the DAAD to attend the International Conference "**ICOMC-2018**, held in Florence, Italy from 15–20th July, **2018**
- ✓ Secured a *travel fellowship* (by the DAAD to attend International Conference "**ICOMC-2014**, Sapporo in Japan held on 13–18th July, **2014**

Invited Talks at National and International Conferences

Title of talk

Carbene Supported Main Group Adducts: Reactive Ligands for Main Group and Transition Metal Chemistry. Delivered at an international conference **ICCSN 2019** (International Conference on Chemical Sciences and Nanomaterials) held on 7-9th March 2019, VIT University, Tamilnadu, India.

Conference Presentations and Workshops

1. **A. Doddi** and M. Tamm, Carbene-Group 15 Element Adducts: Syntheses and Application as Ligands in Main Group and Transition Metal Chemistry; Presented at **28th International Conference on Organometallic Chemistry (ICOMC-2018),** held during 15–20th July 2018 at Florence in Italy.
2. **A. Doddi** and M. Tamm; Applications of NHC-pnictinidenes in the stabilization of reactive organometallic fragments'; presented at 4th Lower Saxonian Catalysis Symposium (NiKAS), heled at Technical University Braunschweig, **19–20th Sept 2016**, Germany.
3. **A. Doddi**, D. Bockfeld and M.Tamm; N-heterocyclic carbene stabilized phosphinidenes: A Versatile Class of Compounds for Main-Group and Transition Metal Chemistry. Poster presented at the **EWPC-13** (European Workshop on Phosphorus Chemistry) held (**7-10th March, 2016**) at the Free University of Berlin, Germany.
4. Attended to the Second International Conference on Sustainable Phosphorus Chemistry (**ICSPC-2016**) held (**9–10th March, 2016**) at the Free University of Berlin, Germany.
5. **A. Doddi**, D. Bockfeld, T. Bannenberg and M. Tamm; N-heterocyclic carbene-phosphinidene and phosphinidyne transition metal complexes and their applications. A poster presented at the **IRIS-14 conference** (International conference on Inorganic Ring Systems), held (July 26-31th, **2015**) at Regensburg, Germany.
6. **A. Doddi**, D. Bockfeld, P. G. Jones and M. Tamm. N-heterocyclic Carbene Supported Phenyl Phosphinidene; A Novel, Strong Electron Donor Ligand for Transition Metal Chemistry; Presented at "XXVI-International Conference on Organometallic Chemistry" (**ICOMC-, 13–18th July 2014**), Sapporo, Japan.
7. **A. Doddi,** T. Bannenberg, D. Bockfeld and M. Tamm; N-Heterocyclic Carbene Functionalized Phosphinidenes; A Novel Class of Low-Valent Phosphorus Reagents for Stabilization of Metal-Phosphorus Bonds; Presented at "XXVI-International Conference on Organometallic Chemistry" (**ICOMC-, 13-18th July 2014**), Sapporo, Japan.
8. **A. Doddi**, D. Bockfeld, P. G. Jones, M. Tamm. "N-heterocyclic carbene stabilized phenylphosphinidene: A novel strong electron donor ligand for transition metal chemistry, presented at "**Coordination Chemistry Conference 10** (10. *Koordinations chemie-Tagung* **2014**), TU Kaiserslautern, 2-4th March **2014**.

9. C. Kroll, **A. Doddi**, C. Wiktor, C. Gemel and R. A. Fischer. Nonaqueous organometallic synthesis of intermetallic nickel-gallium nanoparticles and colloids Abstracts of Papers, 246thACS National Meeting & Exposition, Indianapolis, United States, September 8-12, **2013**.

8. **A. Doddi**, C. Gemel, M. Winter,R. A. Fischer,C. Goedecke,H. S. Rezpa, G. Frenking. "Gallylene supported main-group clusters". International Conference on Organometallic Chemistry, **ICOMC-2012**, Lisbon, Portugal, **2-7th Sept 2012**.

9. **A. Doddi**, Christian Wiktor and Roland A. Fischer, Nanometallurgy in Organic Solution: Organometallic Synthesis of Intermetallic Nickel-Gallium Nanoparticles". International Conference on Organometallic Chemistry, **ICOMC-2012**, Lisbon, Portugal, 2-7th Sept **2012**.

10. **A. Doddi**, C. Gemel, M. Winter, G. Frenking and R. A. Fischer. "N-Heterocyclic Carbene Analogue of Ga(I): A Versatile Ligand for Element-Cluster Stabilization"; (**MTIC-XIV**, Modern Trends in Inorganic Chemistry), **December 10-13th,2011** @ University of Hyderabad, India.

    Selected for the best poster award

11. **A. Doddi**, C. Gemel, M. Winter and R. A. Fischer. "Carbene Like Low valent [Ga(DDP)]: A Versatile Ligand for Reduction and Cluster Formation Reactions". **September-22**, 2ndYoung Chemists Symposium Duisburg-Essen, **2011**, Germany.

12. **A. Doddi**, C. Gemel and R. A. Fischer. Activation, Reduction and Cluster formation reactions with Low valent N-heterocyclic carbene analogue of Gallium (I) (GaDDP)". **September-9, 1st Junges Chemie Symposium Ruhr"–JCS Ruhr 2010,** Germany.

13. **A. Doddi**, G. Prabusankar, C. Gemel and R. A. Fischer. "N-Heterocyclic Carbene analogue of Ga(I): Reduction, Insertion and Cluster formation"; (**MTIC-XIII**, Modern Trends in Inorganic Chemistry), December 7-9th, **2009** @ IISc–Bangalore, India.

14. A. Luiz, **A**. **Doddi**, B. Varghese and M. N. Sudheendra Rao."Synthesis and X-ray Structural Characterization of phosphine derivatives of Molybdenum hexacarbonyl" (**MTIC-XII**); **December 6-8th**, **2007** @ IIT-Madras, India.

15. **A. Doddi** and M. N. Sudheendra Rao; Synthesis and Characterization of Dianionic hexacoordinate Silicon (IV) Complexes of Substituted Catechols, flavones and fluorone: X-ray crystal structures of $[(n\text{-}C_3H_7)_2NH_2)]_2[(Cl_4C_6O_2)_3Si]$. $3CH_3CN$ and $[(n\text{-}C_3H_7)_2NH_2)]_2[(Br_4C_6O_2)_3Si]$. $2(CH_3)_2SO$. (**MTIC-XII**); **December 6-8th**, **2007** @ IIT-Madras, India.

16. Three-day work shop on "Basic Scientific Presentation" for Doctoral Students, Ruhr-University Bochum (11.03.2010 to 13.03.2010).

Oral Presentations in National and International Symposia

1. **A. Doddi** and M. Tamm, Carbene-Group 15 Element Adducts: Syntheses and Application as Ligands in Main Group and Transition Metal Chemistry; Presented at **28th International Conference on Organometallic Chemistry (ICOMC-2018),** held during 15-20th July 2018 at Florence in Italy

2. "NHC-Main Group Adducts: Laboratory Synthesis to Applications" Young Chemists Symposium (**Junges Chemie Symposium**), Technical University Braunschweig, May 9th, **2017**, Germany.

3. "Applications of N-Heterocyclic Carbene-Phosphinidenes in the Stabilization of Reactive Main-Group and Transition Metal Organometallic Fragments". **19th North German University Graduates Symposium (NDDK)**, held at University of Hamburg, September 15-16th, **2016**, Germany.

4. "N-heterocyclic Carbene-Phosphinidyne and Phosphinidene Metal Complexes and their Applications**"** Young Chemists Symposium (**Junges Chemie Symposium**), Technical University Braunschweig, April -16th, **2015**, Germany.

5. "Gallylene Supported Main-Group Clusters". International Conference on Organometallic Chemistry, **XXV-ICOMC-2012**, Lisbon, Portugal, 2-7th Sept **2012** (Oral flash presentation).

6. "Low-Valent Gallium (I) NHC Analogue Stabilized Novel Main-Group Clusters". At **2nd** Young Chemists Symposium (**Junges Chemie Symposium**), University Duisburg-Essen, September-22, **2011**, Germany.

7. "Organometallic Preparation of Nickel-Gallium Alloy Nanoparticles and their Colloids". September-27, 3rdYoung Chemists Symposium (**Junges Chemie Symposium**),"–**JCS Ruhr 2012** at Technical University Dortmund, Germany.

Academic Achievements and Prizes

- ✓ Secured a *Best Poster Award* at the conference MTIC-XIV (***M***odern ***T***rends in ***I***norganic ***C***hemistry). Title of the poster: "N-Heterocyclic Carbene Analogue of Ga(I): A Versatile Ligand for Element-Cluster Stabilization". December 10–13, **2011** @ University of Hyderabad, India
- ✓ Selected for the GSCB (***G***raduate ***S***chool of ***C***hemistry and ***B***iochemistry) to pursue doctoral studies at Ruhr University Bochum, **2009**
- ✓ Qualified in GATE (***G***raduate ***A***ptitude ***T***est in ***E***ngineering, India), **2005**
- ✓ Qualified in all India level entrance examination (JAM: Joint Admission for Masters) to pursue masters in chemistry in Indian Institute of Technology Madras, India

Teaching and Mentoring Activities

- Courses completed: **Chemistry of Transition Metals** (CHM 302) for BS-MS students at IISER Berhampur
- Served as subgroup leader at TU Braunschweig in the research group of Prof. Dr. Matthias Tamm, who is a renowned scientist in organometallics & catalysis
- Bachelor theses supervised: 1 (Stephanie Felten)

Reviewing Experience

Assisted in reviewing several scientific papers

Angew. Chem, JACS, Organometallics, Dalton Trans, Chem. Eur J, Chem Soc Reviews) of high impact factor from reputed international journals

International Exposer and Collaborations

- Work experience gained from three different laboratories in Germany (University of Bonn, Ruhr-University Bochum and Technical University Braunschweig) and attended several international and national conferences (both in Germany and outside Germany)
- Main contributor to four collaborative project works (with the research groups; Prof. Dr. Gernot Frenking- University Marburg (Germany), Prof. Dr. Manfred Scheer-University Regensburg (Germany) and Prof. Dr. Lars Wesemann-University Tübingen (Germany) and Prof. Jose M. Goicoechea-University Oxford (UK).