Dr. Saikat Dutta

Assistant Professor, Department of Chemistry

National Institute of Technology Karnataka (NITK), Surathkal, Mangalore 575025, Karnataka, India

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Personal Information:

Date of Birth: February 05, 1984

Sex: Male

Nationality: Indian

Languages: 1. English: Proficient, 2. Hindi: Proficient, 3. Bengali (native): Proficient

Hobbies: Reading Novels, Gardening, Traveling, Cooking

Mailing Address: 610 Science Block, Dept. of Chemistry, NITK, Surathkal, Mangalore-575025, Karnataka, India.

Educational Qualifications:

Bachelor of Science (2001-2004) in Chemistry (Honors.) along with Physics and Mathematics from the University of Calcutta, Kolkata, India. Secured **First Class** (72.38%) and ranked **7th** in the university. Secured all India rank **TWELVE** in JAM (Joint Admission Test to M.Sc.).

Master of Science (2004-2006) in Chemistry from Indian Institute of Technology Kanpur (IITK), Kanpur, India. Secured **First Class** (8.2/10, 82%).

Doctor of Philosophy (2006-2010) at the Department of Chemistry, University of Iowa, Iowa City, Iowa, USA. Passed all qualifying exams and exempted from taking any undergraduate coursework. Successfully completed **SIX** advanced coursework. **Degree awarded on the 14th of May, 2010**.

Professional background:

Assistant Professor (June, 2015 – To Date):

Assistant Professor at the Department of Chemistry, National Institute of Technology Karnataka (NITK), Surathkal, Mangalore-575025, Karnataka, India. Responsibilities include teaching chemistry (both theory and practical) to undergraduate and graduate students, write research proposal for external funding, set-up laboratory for independent research, mentor M.Sc. and Ph.D. students, and other academic responsibilities (*e.g.*, set up exam papers, member of examination and interview committees, anti-ragging committee, faculty advisor for undergraduate students etc.).

Assistant Professor (July, 2014 – May, 2015):

Assistant Professor at the Department of Chemistry, University of Petroleum & Energy Studies (UPES), Dehradun-248007, Uttarakhand, India. Responsibilities included teaching chemistry (both theory and

practical) courses at B.Tech. level, research and development activities, and academic responsibilities (*e.g.*, design syllabus, set up exam papers, member of interview committee etc.).

Post-doctoral Research Associate (June, 2010 – June, 2014)

Post-doctoral research associate at the Department of Chemistry, University of California Davis, Davis, California 95616, USA. The current duty includes coming up with new research ideas and projects, broaden the existing scope of research, help the supervisor on writing proposals, research papers, patents and review research manuscripts. Experienced in working independently and as a member of a team. Enjoy mentoring graduate and undergraduate students and helping them in their coursework and research projects.

Teaching & Research Assistant (August, 2006 – May, 2010)

Research assistant and Teaching assistant at the Department of Chemistry, University of Iowa, Iowa City, IA-52242, USA. Experienced in classroom teaching, laboratory demonstrations, setting up question papers for exams, proctoring and grading examinations, and attend office hours. I enjoy helping undergraduate students in achieving their academic and research goals.

Previous Research Experience:

Visiting researcher at the University of California Davis, CA95616, USA: (June, 2018 – November, 2018)
Title of Research: *Catalytic isomerization of biomass-derived isosorbide*

Post-doctoral research at the University of California Davis, CA95616, USA: (June, 2010 – July, 2014)
Title of Research: *Renewable, efficient syntheses of fuels and chemicals from cellulose-derived 5-(chloromethyl)furfural*

Doctoral research at the University of Iowa, Iowa City, IA52242, USA: (August, 2006 – May, 2010)
Title of Thesis: *Solid-state reactions in co-crystals: Applications in synthetic chemistry and materials science*

M.Sc. research at the Indian Institute of Technology Kanpur (IITK), India: (Jan, 2006 – April, 2006)
Title of Thesis: *Modular synthesis of self-assembled porous structures using multidentate ligands*

Profile in Google Scholar:
https://scholar.google.com/citations?hl=en&user=qPFwWdcAAAAJ&view_op=list_works&sortby=pubdate

Total Citations: 510; h-index: 12, Total Impact Factor: 125.

Courses Taught:

Graduate Courses:
Dec. 2017-May 2018: Applied Organic Chemistry (CY881)
Aug, 2017 - Dec, 2017: Analytical Chemistry-I (CY705), Organic Chemistry Practical-I (CY707)
Jan, 2017 - May, 2017: Spectroscopy: Applications in Chemistry (CY755), Applied Organic Chemistry (CY881)
Aug, 2016 - Dec, 2016: Organic Chemistry Practical-I (CY707)

Jan, 2016 - May, 2016: Spectroscopy: Applications in Chemistry (CY755)

Undergraduate Courses:

Dec. 2017-May 2018: Chemistry (CY110) (theory), Chemistry (CY111) (lab)
Aug, 2017-Dec, 2017: Chemistry (CY110) (theory)
June, 2017-Aug, 2017: Chemistry (CY110)
Jan, 2017 - May, 2017: Chemistry (CY110) (theory), Chemistry (CY111) (lab)
Aug, 2016 - Dec, 2016: Chemistry (CY110) (theory)
Jan, 2016 - May, 2016: Chemistry (CY110) (theory), Chemistry (CY111) (lab)
Aug, 2015 - Dec, 2015: Chemistry (CY110) (theory), Chemistry (CY111) (lab)
Jan, 2015 - May, 2015: Chemistry CY103 (theory), Chemistry Lab
July, 2014 - Dec, 2014: Chemistry (CY101) (theory), Chemistry (CY103) (theory), Chemistry Practical
Aug, 2006 – May, 2010: Taught principles of organic chemistry (I & II), and chemistry practical courses in the capacity of a teaching assistant at the University of Iowa, Iowa City, USA.

Professional Skills:

- Multi-step organic synthesis, crystallography, green chemistry and catalysis, high pressure and high temperature reactions, pyrolysis
- Hands on experience in analytical instruments (NMR, FT-IR, UV-Vis, GC-MS, HPLC, TGA, DSC, PXRD, and Single Crystal X-ray)
- Several years of teaching experience at the undergraduate and graduate level in the USA and in India.
- Experienced in administrative duties like admission of bachelors, masters, and PhD students, purchasing equipment, member of various academic and administrative committees.
- Worked as Invigilator and Observer for national level exams like JEE (mains), JEE (advanced), and NEET. Served as external examiner at post graduate colleges.
- Organized programs like Global Initiative of Academic Networks (GIAN) as a convener and National Conference as a member.
- A regular computer operator with years of experience in MS Word, Excel, Outlook, Adobe products, Chem Draw, Spartan, CCDC, RestReNova, Scifinder, WinGX, etc.

Awarded Research Grants:

1. Research grant awarded by CSIR, India worth **Rs. 12.5 L** for the research proposal titled "Chemo-catalytic Conversion of Cellulosic Biomass into Fuels and Specialty Chemicals via 5-(Trifluoroacetoxymethyl)furfural". (May, 2017 – April, 2010)
2. Research grant awarded by Department of Science and Technology (DST-SERB), India worth **Rs. 28.99 L** for the research proposal titled *"Renewable synthesis of hydrocarbon fuels and specialty chemicals from cellulose-derived angelica lactone".* (April, 2016 – March, 2019)
3. Research grant by Karnataka State Council for Science and Technology (KSCST) under the Student Project Program (SPP) for the proposal titled 'Chemical-catalytic valorization of paper wastes at the NITK campus' Rs. 5,500 (May, 2016-July, 2016)

Thesis Guided:

Master of Science (M.Sc.): **EIGHT** completed
Doctor of Philosophy (Ph.D.): **ONE** as PI (thesis submitted), **ONE** as Co-PI (thesis submitted), **THREE** as PI (ongoing)

Awards & Honors:

1. **Student Project Proposal** (SPP) awarded by Karnataka State Council for Science and Technology (KSCST), India during Summer, 2016
2. **Travel allowance** for attending Indo-US International Conference on Advanced Lignocellulosic Biofuels (Indo-US CALB-2014) at Indian Institute of Chemical Technology (IICT), Hyderabad, India; awarded by the University of Petroleum & Energy Studies (UPES), Dehradun 248007, Uttarakhand, India (November, 2014).
3. **Travel fellowship** for the 247th National ACS Conference, Dallas, TX, 2014; awarded by the University of California Davis, Davis, California, USA (March, 2014)
4. **Summer fellowship** awarded by the University of Iowa, Iowa City, USA (May, 2009).
5. **Travel fellowship** for the 235th National ACS Conference, New Orleans, LA, 2008; awarded by the Department of Chemistry, University of Iowa, Iowa City, USA.
6. **Scored 92 percentile** in Graduate Record Examination (GRE, 2006) in Chemistry. **Scored 1270/1600** in computer-based GRE in English and **250/300** in the computer-based Test of English as Foreign Language (TOEFL).
7. All India Rank **SIX** (**99.47 percentile**, chemistry) in GATE (Graduate Aptitude Test in Engineering) in 2006, an examination conducted by the Indian Institute of Technology (IIT).
8. Qualified for Lectureship (**LS**) and Junior Research Fellowship (**JRF**) in National Eligibility Test (NET, 2005, chemical science) conducted by Council of Scientific & Industrial Research - University Grants Commission (CSIR-UGC) and also shortlisted for the prestigious Shyama Prasad Mukherjee (**SPM**) Scholarship.
9. All India Rank **ONE** in the admission test for M.Sc. conducted by Banaras Hindu University (BHU, 2004).
10. All India Rank **TWELVE** in Joint Admission Test to M.Sc. (JAM, 2004) conducted by the Indian Institute of Technology (IIT).

Professional Training/Workshop:

1. Safe Handling of Cryogenics and training in Personal Protective Equipments (PPE) in chemistry lab: May, 2013 at University of California Davis (UCD), Davis, CA 95616, USA.
2. Month-long training on 'Information & Communication Technologies (ICT)' in Engineering Education: Jan, 2015 from Indian Institute of Technology Bombay (IITB), Mumbai, India.

Social Service:

A cadet of NSS (National Service Scheme, India) for two years (2001-2003) and engaged in social activities like tree plantation, neighborhood cleaning, literacy campaign, and fund raising for social causes. Actively involved in raising awareness in science among high school students.

Publications:

1. **Dutta, S.**; Georgiev, I. G.; MacGillivray, L. R.**,** Metal-Organic Frameworks with Photochemical Building Units Book Chapter, John Wiley & Sons Inc. https://doi.org/10.1002/9780470606858.ch10
2. Mascal, M.; **Dutta, S.**, Synthesis of the natural herbicide δ-aminolevulinic acid from cellulose-derived 5-(chloromethyl)furfural *Green Chem.* **2011**, *13*, 40-41. https://doi.org/10.1039/C0GC00548G (**I.F. 9.405**)
3. **Dutta, S.**; Bučar, D. -K.; MacGillivray, L. R., Resorcinol-templated synthesis of a cofacial terpyridine in crystalline π-stacked columns *Org. Lett.*, **2011**, *13*, 2260-2262. https://doi.org/10.1021/ol200532t **(I.F. 6.555)**
4. Mascal, M.; **Dutta, S.** Synthesis of ranitidine (Zantac) from cellulose-derived 5-(chloromethyl)furfural *Green Chem.* **2011**, *13*, 3101-3102. https://doi.org/10.1039/C1GC15537G **(I.F. 9.405)**
5. **Dutta, S.**; Bučar, D. -K.; Elacqua, E.; MacGillivray, L. R., Single-crystal-to-single-crystal direct cross-linking and photopolymerisation of a discrete Ag(I) complex to give a 1D polycyclobutane coordination polymer *Chem. Commun.*, **2013**, *49*, 1064-1066. https://doi.org/10.1039/C2CC36458A **(I.F. 6.567)**
6. Mascal, M.; **Dutta, S.**; Gandarias, I., Hydrodeoxygenation of the angelica lactone dimer, a cellulose-based feedstock: simple, high-yield synthesis of branched C_7–C_{10} gasoline-like hydrocarbons *Angew. Chem. Int. Ed.*, **2014**, 53, 1854-1857. doi/10.1002/anie.201308143. https://doi.org/10.1002/anie.201308143 **(I.F. 12.257)**
7. Chang, F.; **Dutta, S.**; Becnel, J. J.; Estep, A. S.; Mascal, M., Synthesis of the insecticide prothrin and its analogues from biomass-derived 5-(chloromethyl)furfural *J. Agric. Food Chem.*, **2014**, *62*, 476-480. http://pubs.acs.org/doi/abs/10.1021/jf4045843 **(I.F. 3.571)**
8. Mascal, M.; **Dutta, S.**, Chemical-catalytic approaches to the production of furfurals and levulinates from biomass *Top. Curr. Chem.*, **2014**, *353*, 41-84. **(I.F. 6.721)** http://link.springer.com/chapter/10.1007%2F128_2014_536#page-1
9. Hutchins, K. M.; **Dutta, S.**; Loren, B. P.; MacGillivray, L. R., Co-Crystals of a Salicylidineaniline: Photochromism Involving Planar Dihedral Angles *Chem. Mater.*, **2014**, *26*, 3042-3044. **(I.F. 9.407)** http://pubs.acs.org/doi/abs/10.1021/cm500823t
10. **Dutta, S.**; Mascal, M., Novel Pathways to 2,5-Dimethylfuran via Biomass-Derived 5-(Chloromethyl)furfural *ChemSusChem*, **2014**, *7*, 3028-3030. **(I.F. 7.804)** http://onlinelibrary.wiley.com/doi/10.1002/cssc.201402702/abstract
11. **Dutta, S.**; Wu, L.; Mascal, M., Efficient, metal-free production of succinic acid by oxidation of biomass-derived levulinic acid with hydrogen peroxide *Green Chem*, **2015**, *17*, 2335-2338. DOI:10.1039/C5GC00098J **(I.F. 9.405)** https://doi.org/pubs.rsc.org/10.1039/C5GC00098J

    Wu, L.; **Dutta, S.**; Mascal, M., Efficient, chemical-catalytic approach to the production of 3-hydroxypropanoic acid by oxidation of biomass-derived levulinic acid with hydrogen peroxide *ChemSusChem*, **2015**, *8*, 1167-1169. https://doi.org/10.1002/cssc.201500025 **(I.F. 7.804)**
12. **Dutta, S.**; Wu, L.; Mascal, M., Production of 5-(chloromethyl)furan-2-carbonyl chloride and furan-2,5-dicarbonyl chloride from biomass-derived 5-(chloromethyl)furfural (CMF) *Green Chem.*, **2015,** *17*, 3737-3739. *https://doi.org/*10.1039/C5GC00936G **(I.F. 9.405)**

13. Chang, F.; **Dutta, S.***; Mascal, M.* Hydrogen-economic synthesis of gasoline-like hydrocarbons by catalytic hydrodecarboxylation of the biomass-derived angelica lactone dimer *ChemCatChem*, **2017**, *9 2622-2626.*, *https://doi.org/*10.1002/cctc.201700314 **(I.F. 4.495)**

14. Onkarappa, B. S.; **Dutta, S*,** High-Yielding Synthesis of 5-(alkoxymethyl)furfurals from Biomass-Derived 5-(halomethyl)furfural (X=Cl, Br) *ChemistrySelect*, ***2019***, *4*, *5540-5543.* ***https://doi.org/10.1002/slct.201900279*** **(I.F. 1.716)**

15. Mohan, A.; **Dutta, S.**; Madav, V. Characterization and upgradation of crude tire pyrolysis oil (CTPO) obtained from a rotating autoclave reactor *Fuel*, **2019**, *250*, 339-351. https://doi.org/10.1016/j.fuel.2019.03.139 **(I.F. 5.128)**

16. Tiwari, R.; Mal, S. S.*****; **Dutta, S*.** A scalable and high-yielding synthesis of 2-(2-furyl)1,3-dioxolane from biomass-derived furfural and ethylene glycol using heteropoly acids as green catalyst *Asian J Chem.*, **2019**, *31*, 1599-1602. https://doi.org/10.14233/ajchem.2019.21994 **(I.F. 0.142)**

17. Onkarappa, S. B.; Javoor, M.; Mal, S. S.*; **Dutta, S.*** Efficient and Scalable Production of Alkyl Levulinates from Cellulose-Derived Levulinic Acid Using Heteropolyacid Catalysts *ChemistrySelect*, **2019**, *4*, 2501-2504. https://doi.org/10.1002/slct.201803641 **(I.F. 1.716)**

18. Onkarappa, B. S.; **Dutta, S*,** Phase Transfer Catalyst Assisted One-Pot Synthesis of 5-(Chloromethyl)furfural from Biomass-Derived Carbohydrates in a Biphasic Batch Reactor *ChemistrySelect*, **2019**, *4*, 7502-7506. https://doi.org/10.1016/j.fuproc.2019.106192 **(I.F. 1.716)**

19. Fraqueza G.; Fuentes J.; **Dutta, S.**; Mal, S. S.; Roller, A.; Giester, G.; Rompel, A.; Aureliano, M. Inhibition of Na+/K+- and Ca2+-ATPase activities by phosphotetradecavanadate *J. Inorg. Biochem.* **2019**, *197*, 110700. https://doi.org/10.1016/j.jinorgbio.2019.110700 **(I.F. 3.224)**

20. Tiwari, R.; Rahman, A.; Bhat, N. S.; Onkarappa, S. B.; Mal, S. S.*; **Dutta, S.*** Efficient Preparation of Alkyl Benzoates by Heteropolyacid-Catalysed Esterification of Benzoic Acid under Solvent-Free Condition *ChemistrySelect*, **2019**, *4*, 9119-9123. https://doi.org/10.1002/slct.201902208 **(I.F. 1.716)**

21. Mascal, M.; **Dutta, S.** Synthesis of highly-branched alkanes for renewable gasoline *Fuel Process Technol.*, **2020**, *197*, 106192. https://doi.org/10.1016/j.fuproc.2019.106192 **(I.F. 4.507)**

22. Onkarappa, B. S.; Bhat, N. S.; Parashuram, D.; **Dutta, S***, Catalytic Conversion of Biomass-Derived Carbohydrates into Levulinic Acid Assisted by a Cationic Surface Active Agent *ChemistrySelect*, **2019**, *4*, 13021-13024. **(I.F. 1.716)**

Patents:

1. **Dutta, S.**; Mascal, M.; Masuno, M., Methods for preparing alkylfurans US9556137B2 (**granted**). https://patents.google.com/patent/US9556137B2/en
2. **Dutta, S.**; Mascal, M., Synthesis of alkylfurans US9868712B2 (**granted**) https://patents.google.com/patent/US9868712B2/en
3. Mascal, M.; **Dutta, S.;** Gandarias, I., Gasoline prepared from biomass-derived levulinic acid PCT Int. Appl. (2015), WO 2015073889 A1. https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2015073889

4. **Dutta, S.**; Mascal, M.; Wu, L., Preparation of compounds from levulinic acid WO 2016123459 A1. https://www.google.com/patents/WO2016123459A1?cl=en
5. **Dutta, S.**; Wu, L.; Mascal, M., Methods for preparing acid halide compounds WO2016191682 A1 https://www.google.com/patents/WO2016191682A1?cl=en (May, 27, 2016)
6. Mascal, M.; Sanka, J.; Zuend, S.; Kindler, A.; **Dutta, S.** Industrially practical technology for the production of isoidide from isosorbide, US Patent, Applied
7. Mascal, M.; **Dutta, S.**, Synthesis of ranitidine (Zantac) U.S. Prov. Pat. Appl. 61/491646.

Media Highlights:

1. Mascal, M.; **Dutta, S.**; Gandarias, I. *Angew. Chem. Int. Ed.*, 2014, 53, 1854-1857. doi/10.1002/anie.201308143. Highlighted in Chemical and Engineering News (C&EN), 2014, link: http://cen.acs.org/articles/92/i6/High-Octane-Biogasoline.html.
2. Mascal, M.; **Dutta, S.**; Gandarias, I. *Angew. Chem. Int. Ed.*, 2014, 53, 1854-1857. ABC news highlight: http://abc7news.com/automotive/lab-breakthroughs-promise-new-fuels/84734/.
3. **Dutta, S.;** Wu, L.; Mascal, M. *Green Chem*, **2015**, *17*, DOI:10.1039/C5GC00098J AND Wu, L.; **Dutta, S.**; Mascal, M. *ChemSusChem*, **2015,** DOI: 10.1002/cssc.201500025 Highlighted in Chemical and Engineering News (C&EN), 2015, http://cen.acs.org/articles/93/i11/Flipping-Switch-Biobased-Chemicals.html

Invited Research Talks:

1. "Reactivity within Crystalline Organic Solids": Invited lecture delivered on July 30th, 2017 at OSA Student Chapter, Manipal University, Manipal, Karnataka.
2. "Renewable syntheses of fuels and chemicals from cellulosic biomass": Lecture delivered on Jan 13, 2015 at the Department of Chemistry, Mangalore University, Mangalore, Karnataka, India.
3. "Gold from garbage: squeezing out petrol & specialty chemicals from a stack of newspaper": Lecture delivered on March 21, 2015 at the Center for Nanoscience & Nanotechnology, University of Petroleum & Energy Studies (UPES), Dehradun, Uttarakhand, India.
4. "Hydrocarbon fuels and specialty chemicals from cellulosic wastes": Lecture delivered on Nov. 12, 2015 at *Chem Splash*, Department of Chemistry, NITK, Karnataka, India

Oral Presentations at Conferences (as presenting author):

1. **Dutta, S.**; Bučar, D. -K.; MacGillivray, L. R., Effects of *ortho*-substituted pyridines on template-directed [2+2] photodimerizations in the solid state. *42nd ACS Midwest Regional Meeting, Kansas City, Missouri, 2007.*
2. **Dutta, S.**; V.; Bučar, D.-K.; MacGillivray, L. R., Substitution effects on the pyridine based handles for template-controlled [2+2] photoreactivity in the solid state. *235th National ACS Meeting, New Orleans, LA, 2008.*
3. **Dutta, S.**; Bucar, D. -K.; MacGillivray, L. R., Modified Handles in Template-Directed [2+2] Photocycloadditions in the Solid State. *43rd Midwest Regional Meeting of the American Chemical Society, Kearney, NE, 2008.*

4. **Dutta, S.**; Bučar, D. -K.; MacGillivray, L. R., Modified handles in template-controlled solid-state reactions. *19th Midwest organic solid state chemistry symposium (MOSSCS), Kansas City, KS, 2008.*
5. **Dutta, S.**; Bučar, D.-K.; MacGillivray, L. R., Template-directed solid state synthesis meets terpyridine. *20th Midwest Organic Solid State Chemistry Symposium (MOSSCS), Kansas City, KS, 2008.*
6. **Dutta, S.**; Bučar, D.-K.; MacGillivray, L. R., Effect of modified handles on self-assembly and photoreactivity in template-directed solid-state synthesis. *11th James F. Jakobsen Graduate Conference, University of Iowa, Iowa City, IA, 2009*.
7. **Dutta, S.**; Bučar, D.-K.; MacGillivray, L. R., Increase in generality of templated solid state syntheses *via* modification of handles. *44th Midwest Regional Meeting of the American Chemical Society, Iowa City, IA, 2009.*
8. **Dutta, S.**; Bučar, D.-K.; MacGillivray, L. R., Supramolecular construction of a cofacial terpyridine in solid state. *James F. 12th Jakobsen Graduate Conference, University of Iowa, Iowa City, IA, 2010*.

Professional References:

(1) ***Prof. Leonard R MacGillivray (Ph.D. Guide)***
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(2) ***Prof. Mark Mascal (Postdoc Supervisor)***
301 Chemistry Building, University of California Davis, Davis, California, CA95616, USA.
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(3) ***Prof. Christopher R Pigge***
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(4) ***Prof. Ned B Bowden***
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