Dr. Sai Ramudu Meka
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EDUCATION

2007-2011 **Ph.D** from **University of Stuttgart,** Stuttgart, Germany
Research work was carried out at **Max Planck Institute for Intelligent Systems** (formerly Metals Research), Stuttgart, Germany
Thesis title: "Nitriding of iron based binary and ternary alloys; microstructural development during nitride precipitation".

2005-2007 **Master of Technology** (M.Tech) in Materials and Metallurgical Engineering from **Indian Institute of Technology, Kanpur,** India.

1998-2002 **Bachelor of Engineering** (B.E) in Metallurgy from **National Institute of Technology Karnataka**, Surathkal, India.

PROFESSIONAL EXPERIENCE

From Sept-2015: **Assistant Professor, Indian Institute of Technology Roorkee**.
Teaching UG and PG students; guiding B.Tech, M.Tech and PhD theses in the area thermochemical surface treatments for metal alloys

2011-2015 **Senior Research Scientist, Max Planck Institute for Intelligent Systems**
Carried research investigations to gain the fundamental understanding of the nitriding behavior of iron-based and titanium-based alloys, martensitic phase transformation in maraging steels, nanocrystalline microstructure evolution in ball milled metals and the thermal stability of nanocrystalline microstructures. I was a daily advisor for 2 Post-docs, 3 Ph.D students, 9 Master thesis students and 2 Bachelor thesis students in the department of Prof. Dr. Ir. E. J. Mittemeijer.

2002-2004 **Junior Manager, Jindal South West Steel Ltd., Toranagallu, Karnataka, India.**
Shift in-charge responsible for controlling the quality of steel strips produced at hot strip mill. Investigating the origins for the defects in the hot rolled steel sheets and taking corrective and preventive measures to minimize/avoid the recurrence of the defects. Interacting with customers to understand their process requirements to design the customized steel grades to meet the specific requirements.

ACHIEVEMENTS, HONOURS AND SCHOLARSHIPS

- **Academic Excellence Award** from Indian Institute of Technology, Kanpur, India for the best performance in the Master's program at IIT during academic year 2006.
- Recipient of **IIT-DAAD Scholarship** in 2006-2007 under which Master's thesis work was carried out at Max Planck Institute for Intelligent Systems, Stuttgart, Germany.
- Received scholarship from **Max Planck Society** during PhD research at Max Planck Institute for Intelligent Systems, Stuttgart.
- S.R. Meka et al, *Int. J. Mater. Res.,* Vol. 99, 2008, p 808 was one among the **most downloaded** papers since 2008 to 2011.
- S.R. Meka et al, *Phil. Mag.,* Vol. 92, 2012, p 1083, runner-up for the 2012 **James Clerk Maxwell Young Writers Prize**. Paper was awarded the distinction of being **highly commended**.
- Co-authored contribution, by T. Steiner, **S.R. Meka**, E. Bischoff, T. Waldenmaier and E.J. Mittemeijer,in European Conference on Heat Treatment and 21st IFHTSE Congress 2014 received the **IFHTSE-Tom Bell Young Author** award. Award was given to Mr. T. Steiner.
- Best poster award at **26th International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM 2019**: K.N.Sasidhar and S.R.Meka "isothermal stabilization of metastable states upon controlled gaseous nitriding"
- **Reviewer for international journals** – Scripta Materialia, Acta Materialia, International Journal of Materials Research, Materials Characterization, Surface and Coatings Technology, Journal of Physics and Chemistry of Solids, Applied Physics Letters, Journal of Alloys and Compounds, Surface and Interface Analysis, Philosophical Magazine, Materials (MDPI), Rare Metals

RESEARCH PROJECTS:

1. Nominated to head the Max Planck Partner Group of Max Planck Institute for Iron Research, Dusseldorf, Germany at IIT Roorkee. For this activity Max Planck Society has provided 20000 Euro/year for first three years. After reviewing the research output of first three years, funding under this scheme has been extended for two more years making total project budget as 100000 Euro (about Rs. 85 lacs). Research work under this project is focused at fundamental understanding of gas/solid interaction with more emphasis on nitriding of steels. This project runs until the end of march 2022.
2. SERB CRG project proposal titled "design of stainless steel chemistry for realization of colossal nitrogen supersaturation upon low temperature nitriding" has been approved with a budget of Rs. 67.9 lacs. This project duration is for 3 years and is expected to start from 2021.
3. Global Institute for Materials Research Tohoku (GIMRT, Japan) proposal titled "Substitutional-Interstitial High Entropy Alloys" has been accepted. Under this, GIMRT supports travel and accommodation expenses of 400000 JPY (about Rs. 3 lacs) for the visit to GIMRT to carry collaborative research work in 2021.

4. Faculty initiation grant of Rs. 10 lacs from IIT Roorkee is received to develop nitride dispersion strengthened steels
5. IMPRINT I project proposal titled "high strength steel sheets and wires production by thermo-mechano—surface-chemical treatment" has been approved with a proposed budget of Rs. 96 lacs. However, the financial support to this project was declined and thus could not execute it.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

1. A.S. Yadav, P.Kurnsteiner, E. Jaegle and **S.R. Meka**[*], Nitridation and hydrogen reduction of Fe-2.3 wt% Al alloy powder, ***Powder Technology***. Vol. 374, 2020, p 527-533.
2. **S.R.Meka**[*], A.Schubert, E.Bischoff and E.J. Mittemeijer, Unusual iron-nitride formation upon nitriding Fe-Si alloy, ***Metallurgical and Materials Transactions A***. Vol. 51, 2020, p 3154-3166.
3. V.M.Rajavel Muthaiah, **S.R.Meka**, B.Venkata Manoj Kumar*****, Development of Dual Phase SiC/Si3N4 Nanostructures on Nanosized SiC particles, **Philosophical Magazine Letters,** Vol. 100, No.2, 2020, p 74-85.
4. Nitin Kumar, G.P. Chaudhari, **S.R.Meka**[*], Investigation of low temperature liquid nitriding conditions for 316 stainless steel for improved mechanical and corrosion response, **Transactions of the Indian Institute of Metals**, Vol. 73, 2020, p. 235-242.
5. K.N. Sasidhar and **S.R. Meka***, Natural air atmosphere induced surface directed spinodal decomposition in stainless steel, **Corrosion Science**, Vol. 166, 2020, 108433.
6. K.N. Sasidhar and **S.R. Meka***, Thermodynamic reasoning for colossal N supersaturation in austenitic and ferritic stainless steels during low-temperature nitridation, **Scientific Reports**, **volume 9**, Article number: 7996 (2019)
7. K.N. Sasidhar and **S.R. Meka*,** Immiscibility regions in iron based ferritic solid solutions and their relevance to thermodynamics and kinetics of nitriding, ***Philosophical Magazine***, Vol. 99, 2019, p 2152-2168.
8. V.M.Rajavel Muthaiah, **S.R.Meka**, B.Venkata Manoj Kumar*****, Processing of heat treated silicon carbide reinforced aluminium alloy composites, ***Materials and Manufacturing Processes***, Vol. 34:3, 2019, p. 312-320.
9. K.N. Sasidhar and **S.R. Meka*,** What causes the colossal C supersaturation of δ-ferrite in stainless steel during low-temperature carburization? ***Scripta Materialia***, Vol. 162, 2019, p. 118-120.
10. K.N. Sasidhar and **S.R. Meka*,** Spinodal decomposition during isothermal gas-solid equilibration – Its effects and implications, ***Acta Materialia***, Vol. 161, 2018, p. 266-272.

11. Z. Hegedus*, **S.R. Meka** and E.J. Mittemeijer. Insitu consolidation of ball milled metals, ***Journal of Alloys and Compounds***, Vol. 695, 2017, p. 721-725.
12. T. Steiner*, **S.R. Meka**, H. Goehring and E.J. Mittemeijer. Alloying element nitride stability in iron-based alloys; denitriding of nitrided Fe–V alloys, ***Materials Science and Technology*****,** Vol. 33, 2017, p 23-32.
13. C.W. Kang, **S.R. Meka***, T. Steiner, R.E. Schacherl and E.J. Mittemeijer. Microstructural evolution of 31CrMoV9 steel upon controlled gaseous nitriding treatment, ***HTM Journal of Heat Treatment and Materials***, Vol. 71, 2016, p. 181-190.
14. M. Akhlaghi*, **S.R. Meka,** E.A. Jaegle, S.J.B. Kurz, E. Bischoff and E.J. Mittemeijer. Formation mechanisms of alloying element nitrides in recrystallized and deformed ferritic Fe-Cr-Al alloy, ***Metallurgical and Materials Transactions A*****.** Vol. 47, 2016, p. 4578-4593.
15. M. Jung, **S.R. Meka*** and E.J. Mittemeijer. Incubation time for iron-nitride layer formation upon gaseous nitriding of iron-based alloys, ***Philosophical Magazine*****.** Vol. 96, 2016, p. 1369-1385.
16. T. Steiner*, **S.R. Meka,** B. Rheingans, E. Bischoff, T. Wadenmaier, G. Yeli, T.L. Martin, P.A.J. Bagot, M.P. Moody and E.J. Mittemeijer. Continuous and discontinuous precipitation in Fe-1 at.%Cr-1 at.%Mo alloy upon nitriding; crystal structure and composition of ternary nitrides, ***Philosophical Magazine.*** Vol. 95, 2016. p 1509-1537.
17. T. Steiner*, **S.R. Meka,** E. Bischoff, T. Waldenmaier and E.J. Mittemeijer. Nitriding of ternary Fe-Cr-Mo alloys; role of the Cr/Mo ratio, ***Surface and coatings technology.*** Vol. 291, 2016, p 21-33.
18. M. Akhlaghi*, T. Steiner, **S.R. Meka** and E.J. Mittemeijer. Misfit induced changes of lattice parameters in two-phase systems: Coherent/incoherent precipitates in a matrix, ***Journal of Applied Crystallography,*** Vol. 49, 2016, p 69-77.
19. M. Jung*, **S.R. Meka**, B. Rheingans and E.J. Mittemeijer. Coupling inward diffusion and precipitation kinetics; the case of nitriding iron-based alloys, ***Metallurgical and Materials Transactions A*****.** Vol. 47A, 2016, p 1425-1439.
20. Z. Hegedus*, **S.R. Meka** and E.J. Mittemeijer. Crystallite growth in nanocrystalline tungsten; rate determining mechanism and the role of contaminations, ***Acta Materialia*****,** Vol. 105, 2016, p 232-243.
21. **S.R. Meka**[*], A. Chauhan, T. Steiner, E. Bischoff, P.K. Ghosh and E.J. Mittemeijer. Generating duplex microstructures by nitriding; the nitriding of iron-based Fe-Mn alloy, ***Materials Science and Technology*****,** Vol. 32, 2016, p 883-889.
22. M. Akhlaghi[*], M. Jung, **S.R. Meka**, M. Fonovic, A. Leineweber and E.J. Mittemeijer. Dependence of the nitriding rate of ferritic and austenitic substrates on the crystallographic orientation of surface grains; gaseous nitriding of Fe-Cr and Ni-Ti alloys, ***Philosophical Magazine.*** Vol. 95, 2015, p 4143-4160.
23. M. Akhlaghi, T. Steiner, **S.R. Meka**[*], A. Leineweber and E.J. Mittemeijer. Lattice-parameter change induced by accommodation of precipitate/matrix misfit; misfitting nitrides in ferrite, ***Acta Materialia,*** Vol. 98, 2015, p 254-262.

24. T. Steiner, M. Akhlaghi, **S.R. Meka**[*]and E.J. Mittemeijer. Diffraction-line shifts and broadenings in continuously and discontinuously coarsening precipitate-matrix systems; coarsening of initially coherent nitride precipitates in a ferrite matrix, ***Journal of Materials Science.*** Vol. 50, 2015, p 7075-7086.
25. S. Loewy[*], B. Rheingans, **S.R. Meka** and E.J. Mittemeijer. Modulated martensite-formation behavior in Fe-Ni based alloys; athermal and thermally activated mechanisms, ***Journal of Materials Research***, Vol. 30, 2015, p 2101-2107.
26. S.J.B. Kurz[*], **S.R. Meka**, N. Schell, W. Ecker, J. Keckes, E.J. Mittemeijer. Residual stress and microstructure depth gradients in nitrided iron-based alloys revealed by dynamical cross-sectional transmission X-ray microdiffraction, ***Acta Materialia***, Vol. 87, 2015, p 100-110.
27. C.W. Kang, **S.R. Meka***, R.E. Schacherl and E.J. Mittemeijer. Nitriding response of a quaternary iron-based Fe-2.82at.%Cr-0.13at.%Mo-0.18at.%V alloy, ***Metallurgical and Materials Transactions A*****.** Vol. 46A, 2015, p 328-336.
28. B. Schwarz,H. Göhring, **S.R. Meka***, R.E. Schacherland E.J. Mittemeijer. Pore formation upon nitriding iron and iron-based alloys; the role of alloying elements and grain boundaries, ***Metallurgical and Materials Transactions A***, Vol. 25A, 2014, p 6173-6186.
29. **S.R. Meka**[*], E. Bischoff, S.S. Hosmaniand E.J. Mittemeijer. Interrelationships of defects, nitride modification and excess nitrogen in nitrided Fe-4.75 at.% Al alloy, ***International Journal of Materials Research,*** Vol. 105, 2014, 11, p 1057-1066.
30. B. Schwarz, P.J. Rossi, L. Straßberger, F. Jörg, **S.R. Meka***, E. Bischoff, R.E. Schacherl, and E.J. Mittemeijer. Coherency strain and precipitation kinetics; crystalline and amorphous nitride formation in ternary Fe-Ti/Cr/V-Si alloys, ***Philosophical Magazine***, Vol. 94, 2014, 27, p 3098-3119.
31. B. Schwarz, **S.R. Meka**[*], R.E. Schacherl, E. Bischoff and E.J. Mittemeijer. Nitriding of Iron-based Ternary Fe-V-Si Alloy; The Precipitation Process of Separate Nitrides, ***Acta Materialia***, Vol. 76, 2014, p 394-403.
32. S. Loewy[*], B. Rheingans, **S.R. Meka** and E.J. Mittemeijer. Unusual martensite-formation kinetics in steels: observation of discontinuous transformation rates, ***Acta Materialia***, Vol. 64, 2014, p 93-99.
33. H. Selg, E. Bischoff, **S.R. Meka**, R.E. Schacherl[*], T. Waldenmaier and E.J. Mittemeijer. Molybdenum-nitride precipitation in recrystallized and cold rolled Fe-1at.%Mo alloy, ***Metallurgical and Materials Transactions A***, Vol. 44A, 2013, p 4059-4070.
34. J. Stein, R.E. Schacherl[*], M. Jung, **S.R. Meka**, B. Rheingans and E.J. Mittemeijer. Solubility of nitrogen in ferrite; the Fe-N phase diagram, ***International Journal of Materials Research*****,** Vol. 104,2013, 11, p 1053-1065.
35. **S.R. Meka**[*] and E.J. Mittemeijer. Abnormal nitride morphologies upon nitriding iron-based substrates, ***JOM***, Vol. 65, 2013, p 769-775.
36. H. Selg, E. Bischoff, I. Bernstein, T. Woehrle, **S.R. Meka**[*], R.E. Schacherl, T. Waldenmaier and E.J. Mittemeijer. Defect-dependent nitride surface-layer development upon nitriding of Fe-1 at.%Mo alloys, ***Philosophical Magazine,*** Vol. 93, 2013, p 2133-2160.

37. H. Selg, **S.R. Meka***, M. Kachel, R. Schacherl, T. Waldenmaier and E.J. Mittemeijer. Nitriding behaviour of maraging steel: experiments and modelling, ***Journal of Materials Science***, Vol. 48, 2013, p 4321-4335.
38. G.K. Rane, U. Welzel, **S.R. Meka*** and E.J. Mittemeijer. Non-monotonic lattice parameter variation with crystallite size in nanocrystalline solids, ***ActaMaterialia,*** Vol. 61, 2013, p 4524-4533.
39. **S.R. Meka***, E. Bischoff, B. Rheingans and E.J. Mittemeijer. Octapod-shaped, nanosized, amorphous precipitates in a crystalline ferrite matrix, ***Philosophical Magazine Letters,*** Vol. 93, 2013, p 238-245.
40. **S.R. Meka***, E. Bischoff, R.E. Schacherl and E.J. Mittemeijer. Unusual nucleation and growth of γ′ iron nitride upon nitriding Fe-4.75at.%Al alloy, ***Philosophical Magazine,*** Vol. 92, 2012, p 1083-1105.
41. **S.R. Meka***, K.S. Jung, E. Bischoff and E.J. Mittemeijer. Unusual precipitation of amorphous silicon nitride upon nitriding Fe-2at.%Si alloy, ***Philosophical Magazine***, Vol. 92, 2012, p 1435-1455.
42. K.S. Jung, **S.R. Meka**, R.E. Schacherl*, E. Bischoff and E.J. Mittemeijer. Nitride formation and excess nitrogen uptake upon nitriding ferritic Fe-Ti-Cr alloys, ***Metallurgical and Materials Transactions A***, Vol. 43A, 2012, p 934-944.
43. **S.R. Meka***, R.E. Schacherl, E. Bischoff and E.J. Mittemeijer. Ideally weak nitriding kinetics during gaseous nitriding of Fe-2at.%Si alloy, ***HTM Journal of Heat Treatment and Materials***, Vol. 66, 2011, p 103-108.
44. **S.R. Meka**, S.S. Hosmani, A.R. Clauss and E.J. Mittemeijer*. The emergence and disappearance of a high density of microcracks in nitrided Fe-4.65at.%Al alloy, ***International Journal of Materials Research***, Vol. 99, 2008, p 808-814.

* Corresponding author

EDITORIAL RESPONSIBILITIES

S.R.Meka and G.P. Chaudhari, Editors, proceedings of International conference on **Advances in Materials & Processing: Challenges & Opportunities" (AMPCO-2017). P**ublished by Elsevier in Materials Today: Proceedings.

RESEARCH GUIDANCE

doctoral students at IIT Roorkee

1	Mr. K.N. Sasidhar (completed) B.Tech:Metallurgical and Materials Engg. Topic: metastable paraequilibrium states accessible during Gas/Solid equilibriation Enrolled as a PhD student in July 2017 He is the recipient of prime minister research fellowship (**PMRF**)
2	Mr. Akeshwar Singh Yadav (ongoing) B.Tech: Mechanical, M.Tech: Metallurgical and Materials Engg. Topic: Aluminium-Nitride dispersion strengthened steels Enrolled as a PhD student in December 2015
3	Mr. Devdutt Singh (ongoing) B.Tech: Metallurgical Engg

	Topic: Diffusional processes in photovoltaic solar cells Enrolled as a PhD student in December 2016 Sponsored candidate from BHEL, Haridwar
4	Mr. Nitin (co-guide: Prof.G.P. Chaudhari) (ongoing) B.Tech: Mechanical, M.Tech: Metallurgical and Materials Engg. Title: Properties of Thermo-Mchano-Chemical surface treated stainless steels Enrolled as a PhD student in Jan 2017
5	Ms. Amuth (ongoing) B.Tech: Metallurgical and Materials Engg. Topic: High nitrogen stainless steels Recipient of prime minister research fellowship (**PMRF**) Enrolled as a PhD student in July 2018
6	Mr.Subodh Rana (ongoing) B.Tech:Metallurgical and Materials Engg. Topic: Boriding of steels Enrolled as a PhD student in Jan 2019
7	Ms.Anupama Kashyap (ongoing) B.Tech:Mechanical Engg. M.Tech: Materials Engg Topic: oxidation and nitridation of stainless steels Enrolled as a PhD student in Jan 2020

CONTRIBUTIONS IN CONFERENCES AND SCIENTIFIC MEETINGS

1. K.N. Sasidhar and **S.R. Meka**. Isothermal stabilization of metastable states upon controlled gaseous nitriding. Poster presentation at **26th International Symposium on Metastable, Amorphous and Nanostructured Materials (ISMANAM 2019),** July 8-12, 2019, Chennai, India. ***Received Best Poster Award.***
2. K.N. Sasidhar, A.Kumar and **S.R. Meka.** Aluminium Partitioning Triggered by Inward Diffusing Carbon During Carburization of Fe2.3wt%Al Alloy, Oral presentation at the **14th International Conference on Diffusion in Solids and Liquids (DSL-2018),** June 25-29, 2018, Amsterdam, The Netherlands.
3. A.S. Yadav, J. Singh and **S.R. Meka.** Carburization Induced Phase Transformation in Fe-2wt.% Mn Alloys, Oral presentation at the **14th International Conference on Diffusion in Solids and Liquids (DSL-2018),** June 25-29, 2018, Amsterdam, The Netherlands.
4. **S.R. Meka**, A. Schubert, E.Bischoff and E.J. Mittemeijer. Development of Nitrides of Silicon and Iron upon Nitriding Fe-Si alloys, Oral presentation at the **European Conference on Heat Treatment (ECHT 2018),** April 12-13, 2018, Friedrichshafen, Lake Constance, Germany.
5. A. S. Yadav, S. K. Rajulapati and **S.R. Meka,** Nitridation of Fe-2.3 wt.% Al alloy powder and its compaction by spark plasma sintering**,** oral presentation by **A.S. Yadav** at **International Conference on Advances in Materials & Processing: Challenges & Opportunities" (AMPCO-2017),** IIT Roorkee, Roorkee, 30th Nov. – 2nd December, 2017**. Materials Today: Proceedings 5 (2018) 17239–17246.**

6. S. K. Rajulapati, A.D. Saggurthi A. S. Yadav, and **S.R. Meka,** Crystallite size and microstrain in mechanically alloyed and heat treated Fe-25 wt.% Y_2O_3**,** oral presentation by **S.K. Rajulapati** at **International Conference on Advances in Materials & Processing: Challenges & Opportunities" (AMPCO-2017),** IIT Roorkee, Roorkee, 30th Nov. – 2nd December, 2017**. Materials Today: Proceedings 5 (2018) 16904–16911.**

7. **S.R. Meka.** Nitriding induced microstructural evolution in Iron-based alloys, invited oral presentation at ***International Conference on*** **Recent Advances in Materials, Mechanical and Civil Engineering** ICRAMMCE-2017, June 01 to June 02, 2017, Hyderabad, India.

8. **S.R. Meka.** Stress and defects driven phase transformations, oral presentation at **Heads of Max Planck Indian partner groups bi-annual-meeting 2017**, March 03 to March 05, 2017, IISER Mohali, Mohali, India.

9. **S.R. Meka.** Nitriding of Iron-based alloys, Oral presentation at joint international conferences **emerging materials and processes for defense and infrastructure** and **advanced heat processing,** organized by ASM International-India chapter**,** October 12 to October 14, 2016, Mumbai, India.

10. T. Steiner, **S.R. Meka**, T. Waldenmaier and E.J. Mittemeijer. Internal nitriding of Fe-Cr-Mo alloys; Precipitation of mixed nitrides and role of the Cr/Mo ratio, Oral presentation by T. Steiner at **ASM Heat Treat Society Conference & Exposition,** October 20 to October 22, 2015. Detroit, USA.

11. S. Loewy, B. Rheingans, **S.R. Meka** and E.J. Mittemeijer. Modulated martensite formation behavior in Fe-Ni steels. Oral presentation by S. Loewy at **10th European Symposium on Martensitic Transformations (ESOMAT)**, September 14 to September 18, Antwerp, Belgium.

12. M. Akhlaghi, T. Steiner, **S.R. Meka**, A. Leineweber and E.J. Mittemeijer. Misfit induced changes of lattice parameters in two-phase systems: Coherent/incoherent precipitates in a matrix, poster presentation by M. Akhlaghi at **International Conference on Solid-Solid Phase Transformations in Inorganic Materials (PTM 2015),** June 28 to July 3, 2015, Whistler, BC, Canada.

13. M. Jung, **S.R. Meka**, B. Rheingans and E.J. Mittemeijer. Simulation of simultaneously occurring coupled inward diffusion and internal precipitation, oral presentation by M. Jung at **International Conference on Solid-Solid Phase Transformations in Inorganic Materials (PTM 2015),** June 28 to July 3, 2015, Whistler, BC, Canada.

14. **S.R. Meka**, A. Chauhan, T. Steiner and E.J. Mittemeijer. Development of austenite-martensite and ferrite-austenite duplex microstructure upon nitriding Fe-Mn alloys. Oral presentation at the **European Conference on Heat Treatment and 22nd IFHTSE Congress,** May 20-22, 2015, Venice, Italy.

15. T. Steiner, **S.R. Meka** and E.J. Mittemeijer. Composition, crystalstructure and kinetics of formation of nitride precipitates in Fe-Cr-Mo alloys, oral presentation by T. Steiner at AWT (Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechni) - **Fachausschuss Nitrieren und Nitrocarburieren** (Nitriding and Nitrocarburising Board of AWT), May 7, 2015, Gommern, Germany.

16. T. Steiner, **S.R. Meka**, E. Bischoff, T. Waldenmaier and E.J. Mittemeijer. Internal nitriding of ternary Fe-Cr-Mo alloys; nitride development, oral presentation by T. Steiner at **European**

Conference on Heat Treatment and 21st IFHTSE Congress, May 12-15, 2014, Munich, Germany.

17. M. Akhlaghi, **S.R. Meka**, E. Bischoff and E.J. Mittemeijer. Low temperature nitriding of ferritic Fe-Cr-Al alloys, oral presentation by M. Akhlaghi at **European Conference on Heat Treatment and 21st IFHTSE Congress,** May 12-15, 2014, Munich, Germany.
18. S.J.B. Kurz, **S.R. Meka**, N. Schell, J. Keckes and E.J. Mittemeijer. Residual stress gradients in nitrided Iron-based alloys revealed by cross-sectional high-energy X-ray micro-diffraction, oral presentation by S.J.B. Kurz at **9th European Conference on Residual Stresses,** July 7-9, 2014, Troyes, France.
19. S. Loewy, B. Rheingans, **S.R. Meka** and E.J. Mittemeijer. Unusual martensite-formation kinetics in steels: observation of a series of transformation–rate maxima, oral presentation by S. Loewy at **International conference on martensitic transformations,** July 6-11, 2014, Bilbao, Spain.
20. **S.R. Meka**, B. Rheingans, E. Bischoff and E.J. Mittemeijer.Unusual Octapod-shaped, Nanosized Amorphous Silicon-nitride Particles in a Crystalline Ferrite Matrix, Poster presentation at the international conference, **2013 MRS Spring Meeting & Exhibit**, April 1-5, 2013, San Francisco, USA.
21. **S.R. Meka** and E.J. Mittemeijer. Thermodynamics and kinetics of the competition of internal and external precipitation; morphology, constitution and structure of iron nitrides grown on iron-based alloy substrates, Oral presentation at the international conference, **2013 E- MRS Spring Meeting**, May 27-31, 2013, Strasbourg, France.
22. **S.R. Meka**, E. Bischoff, B. Rheingans, R.E. Schacherland E.J. Mittemeijer. Anomalous nitriding behaviour of Iron-based Fe-Si alloys, oral presentation at AWT (Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechni) - **Fachausschuss Nitrieren und Nitrocarburieren** (Nitriding andNitrocarburising Board of AWT), November 27, 2013, Issum, Germany.
23. **S.R. Meka**, E. Bischoff, B. Rheingans and E.J. Mittemeijer.The development of amorphous and crystalline nanoparticles of silicon nitride in ferrite; role of interfacial energy and elastic anisotropy upon phase transformation, Oral presentation at the international conference, **Materials Science and Engineering 2012**, September 25-27, 2012, Darmstadt, Germany.
24. **S.R. Meka**. Unusual phase-transformation phenomena during nitriding of iron-based alloys, Oral presentation during meeting of board of trustees, Max Planck Institute for Intelligent Systems, Stuttgart. November 17, 2010, Stuttgart, Germany.
25. **S.R. Meka**, E. Bischoff, R.E. Schacherl and E.J. Mittemeijer. Influence of lattice defects on nucleation and growth of different modifications of nanoprecipitates of AlN in nitrided Fe-Al alloy, Oral presentation at the international conference, **Materials Science and Engineering 2010**, August 24-26, 2010, Darmstadt, Germany.
26. **S.R. Meka**, R.E. Schacherl, E. Bischoff and E.J. Mittemeijer.Internal gaseous nitriding of Fe-2at%Si alloy: Ideally weak nitriding interaction and formation of amorphous silicon-nitride precipitates, Oral presentation at **European Conference on Heat Treatment 2010:** Nitriding and Nitrocarburising, April 29-30, 2010, Aachen, Germany.

27. **S.R. Meka**, R.E. Schacherl, E. Bischoff and E.J. Mittemeijer. Unusual microstructural development upon gaseous nitriding of Fe-4.65at.% Al alloy, Poster presentation at **THERMEC 2009**, International conference on processing and manufacturing of advanced materials, August 25-29, 2009, Berlin, Germany. ***Advanced Materials Research***, Vol. 89-91, 2010, p 371-376.

28. **S.R. Meka**. Unusual microstructural development during nitriding of iron-based Fe-Al alloy, oral presentation at AWT (ArbeitsgemeinschaftWärmebehandlung und Werkstofftechni) - **FachausschussNitrieren und Nitrocarburieren** (Nitriding and Nitrocarburising Board of AWT), September 17, 2009, Wels, Austria

Research guidance at Max Planck Institute for Intelligent Systems, Stuttgart, Germany

Offered research guidance to post-docs, Ph.D. students and master students during my stay at Max Planck Institute for Intelligent Systems, Stuttgart, Germany. Note that in Germany, officially only professor can be the main supervisor of doctoral thesis: in all the below listed post-doc research projects, dissertations and master thesis projects Prof. Mittemeijer was the main advisor.

Details of post-doc research projects co-guided by me

Sl. No.	Name of post-doc	Research Topic	Institute	Other supervisors
1	Dr. Z. Hegedus	Microstructure of severely plastically deformed metals and the thermal stability of nanocrystalline metals	Max Planck Institute for Intelligent Systems (MPI-IS), Stuttgart, Germany.	Prof. E. J. Mittemeijer
2	Dr. M. Jung	Modeling the evolution of nitrided-region upon gaseous nitriding of Iron alloys	Max Planck Institute for Intelligent Systems (MPI-IS), Stuttgart, Germany..	Prof. E. J. Mittemeijer and Dr. B. Rheingans

Details of Ph.D theses co-guided by me

Sl. No.	Name of student	Topic	Institutes	Date of submission	Other supervisors
1	Tobias Steiner	Internal precipitation of nitrides in iron-based alloys	University of Stuttgart and Max Planck Institute for Intelligent Systems (MPI-IS), Stuttgart, Germany.	18.03.16	Prof. E.J. Mittemeijer
2	Sarah Loewy	Formation of lath martensite	University of Stuttgart and MPI-IS, Stuttgart, Germany.	08.12.15	Prof. E.J. Mittemeijer and Dr. B. Rheingans
3	Maryam Akhlaghi	Precipitation of nitrides in iron-based binary and ternary alloys	University of Stuttgart and MPI-IS, Stuttgart, Germany.	25.11.15	Prof. E.J. Mittemeijer
4	Benjamin Schwarz	Gas nitriding of Iron-based alloys	University of Stuttgart and MPI-IS, Stuttgart, Germany.	30.07.14	Prof. E.J. Mittemeijer and Dr. R. Schacherl

Details of master theses co-guided by me

Sl. No.	Name of student	Topic	Institute	Year	Other supervisors
1	Angelika Schubert	Compound layer formation during nitriding of Fe-Si alloys	University of Stuttgart	2010	Prof. E.J. Mittemeijer and Dr. R. Schacherl
2	Thomas Ewald	Formation of γ′ iron-nitride in a ferrite matrix	University of Stuttgart	2010	Prof. E.J. Mittemeijer and Dr. E. Bischoff
3	Benjamin Schwarz	Gas nitriding of Fe-2at.%Al alloy	University of Stuttgart	2010	Prof. E.J. Mittemeijer and Dr. R. Schacherl
4	Yuantao Cui	Nitriding of Fe-Si-Al alloys	University of Stuttgart	2012	Prof. E.J. Mittemeijer and Dr. R. Schacherl
5	Tobias Steiner	Nitriding of Ti and Ti-Al alloys	University of Stuttgart	2012	Prof. E.J. Mittemeijer
6	Emilia Schwindt	Microstructure and grain growth of nanocrystalline ball-milled Pd	University of Stuttgart	2013	Prof. E.J. Mittemeijer
7	Ankur Chauhan	Nitriding of Fe-Mn alloy & Pure-Ti	University of Stuttgart and IIT Roorkee	2014	Prof. E.J. Mittemeijer and Prof. P.K. Ghosh

PARTICIPATION IN INDUSTRIAL NITRIDING RESEARCH PROJECTS

As a co-investigator, involved in industrial nitriding research projects carried out at department Mittemeijer, MPI-IS Stuttgart. In these projects usually industry funds a Ph.D student or a research engineer who resides at the Max Planck Institute to carry out the required research. In the below mentioned projects, I was a co-investigator and all the projects were executed under the leadership of Prof. Mittemeijer. As the research carried out was of direct technological relevance, only the brief summary is presented without specific technical details.

1. **Company:** Robert Bosch GmbH, Stuttgart, Germany
   My role: Co-investigator (**Dr. H. Selg** was the principle investigator)
   Project description: Above indicated company was already employing gaseous nitriding treatment to enhance the performance of their several automotive engineering components. Company was interested in understanding the nitriding response of a maraging steel which they utilize to produce a key automobile component. We have performed fundamental investigations on their steel specimens and also on model alloy specimens based on the corresponding steel chemistry.

2. **Company:** Hyundai Motors, South Korea
   My role: Co-investigator (Mr. **C.W. Kang** was the principle investigator)
   Project description: Above indicated company was already employing the gaseous nitriding treatment to enhance the fatigue and wear resistances of automobile transmission gears. However, they had some premature failure of components which they wanted to rectify. For that they deployed their employee (Mr. C.W. Kang) at Dept. Mittemeijer to investigate the problem utilizing our expertise in this field. We have investigated their steel specimens and also the model alloys related to their steel.

3. **Company:** Robert Bosch GmbH, Stuttgart, Germany
   My role: Co-investigator (Mr. **T. Steiner** was the principle investigator)
   Project description: Above indicated company was already employing the gaseous nitriding treatment to enhance the performance of their several automotive engineering components. Company was interested in understanding the nitriding response of high carbon steel which they utilize to produce a key automobile component. We are performing fundamental investigations on their steel specimens and model alloys based on their steel chemistry so that the optimal nitriding parameters can be explored.