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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” . Supervisor: **Prof. Dr. E.J.Mittemeijer**
- 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

- 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.

PUBLICATIONS IN PEER-REVIEWED JOURNALS

1. 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, under review, *Journal of Applied Crystallography*.
2. M. Jung*, **S.R. Meka**, B. Rheingans and E.J. Mittemeijer. Coupling inward diffusion and precipitation kinetics; the case of nitriding iron-based alloys, accepted, *Metallurgical and Materials Transactions A*.
3. M. Akhlaghi*, M. Jung, **S.R. Meka**, M. Fonovic, A. Leineweber and E.J. Mittemeijer. Surface-grain orientation dependence of nitriding rate of ferritic and austenitic substrates; gaseous nitriding of Ni-Ti and Fe-Cr alloys, accepted, *Philosophical Magazine*.
4. Z. Hegedus*, **S.R. Meka** and E.J. Mittemeijer. Crystallite growth in nanocrystalline tungsten; rate determining mechanism and the role of contaminations, under review, *Acta Materialia*.
5. **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*, DOI:10.1179/1743284715Y.0000000098
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. B. Schwarz, H. Göhring, **S.R. Meka***, R.E. Schacherl and 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.
12. **S.R. Meka***, E. Bischoff, S.S. Hosmani and 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.
13. 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.
14. 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.

15. 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.
16. 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.
17. 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.
18. **S.R. Meka*** and E.J. Mittemeijer. Abnormal nitride morphologies upon nitriding iron-based substrates, *JOM*, Vol. 65, 2013, p 769-775.
19. 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.
20. 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.
21. G.K. Rane, U. Welzel, **S.R. Meka*** and E.J. Mittemeijer. Non-monotonic lattice parameter variation with crystallite size in nanocrystalline solids, *Acta Materialia*, Vol. 61, 2013, p 4524-4533.
22. **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.
23. **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.
24. **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.
25. 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.
26. **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.
27. **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.

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CONTRIBUTIONS IN CONFERENCES AND SCIENTIFIC MEETINGS

1. 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.
2. 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.
3. 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.
4. 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.
5. **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.
6. 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 Werkstofftechnik) - **Fachausschuss Nitrieren und Nitrocarburieren** (Nitriding and Nitrocarburising Board of AWT), May 7, 2015, Gommern, Germany.
7. 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.
8. 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.
9. 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.
10. 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.

11. **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.
12. **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.
13. **S.R. Meka**, E. Bischoff, B. Rheingans, R.E. Schacherl and E.J. Mittemeijer. Anomalous nitriding behaviour of Iron-based Fe-Si alloys, oral presentation at AWT (Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechnik) - **Fachausschuss Nitrieren und Nitrocarburieren** (Nitriding and Nitrocarburising Board of AWT), November 27, 2013, Issum, Germany.
14. **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.
15. **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.
16. **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.
17. **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.
18. **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.
19. **S.R. Meka**. Unusual microstructural development during nitriding of iron-based Fe-Al alloy, oral presentation at AWT (Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechnik) - **Fachausschuss Nitrieren und Nitrocarburieren** (Nitriding and Nitrocarburising Board of AWT), September 17, 2009, Wels, Austria.

ACHIEVEMENTS, HONOURS AND SCHOLARSHIPS

- First prize in **metallurgical quiz** (year 2001) conducted by Metallurgical Engineering Association, Surathkal, India.
- Elected as a convener for reading rooms in NITK Surathkal for the year 2002. I was the coordinator for the intra college cultural festival-2002 at NITK Surathkal.
- One among the founders of “**Abhyudaya**”, a non-profit making unit runs by the students of NIT Surathkal to provide facilities to the government schools around NIT surathkal.
- Cleared all India level **Graduate Aptitude Test in Engineering – 2003**.
- **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.
- **Reviewer for international journals** – Scripta Materialia, International Journal of Materials Research, Materials Characterization, Surface and Coatings Technology, Journal of Physics and Chemistry of Solids, Applied Physics Letters.