

Communication scientifique, écrite et orale, en langue anglaise

Session 10.

Scientific contact and Curriculum Vitae

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1. Scientific contact

In this part some guidelines are given for establishing a scientific collaboration. However, in any case, the experience and advice of your adviser should be considered.

Contact making during your doctoral studies

Contact based on literature

When you start your doctoral studies, first of all you have to do a literature investigation. Usually your supervisor has collected literature on the special subject, but probably it is not complete. If you are lucky, you have access to a literature investigation system at your university, where search is done with regard to specific keywords in a large collection of journals and books. However, literature investigation systems are quite expensive and the university has to pay for it. If you manage to get a list of publications in your field of interest (sometimes with abstracts) then these may be looked into in detail in the library or what is much more convenient via Internet, if allowed.

Sometimes such papers are mentioned, which are published in conference proceedings or laboratory reports. Such papers are difficult to find in libraries. In this case, it is necessary to contact one of the authors (if the address is known from somewhere else, for example, from Internet) and ask for copies. It is also advisable to ask for *reprints* of related papers or copies of *papers in press*. The fastest and cheapest way to send an e-mail, if the address is known.

Scientific contacts are necessary to contrast results or to get information on technical details (materials: purity, processing, methods of investigation, etc.). In your letter, explain clearly your problems and questions.

In an advanced phase of your doctoral work, you will present your results at national and international workshops and conferences. In this way, you get in contact with scientists working in the same field. Now, discussions are possible after the talks as well as during the meeting. It is the best and most efficient way getting in contact with other colleagues. Often such contacts lead to collaboration and joint proposals (see below).

Post-doc positions

When you have finished your thesis or you are just before finishing it, you have to decide whether you want to work a certain time as a post-doctor. A post-doc period is strongly recommended in any case whether you are going to work for a company or stay at the university or in a research lab. To start a scientific carrier it is a *must*. Generally, a post-doc period is one to two years long and is spent in a *foreign* country. It allows you to work in a new research team, that is, get to know new people, learn new ways of solving problems and new techniques. Moreover - and this is quite important - you will improve your foreign language and learn about the culture of the guest country and the mentality of its inhabitants.

How to find a post-doc position?

First of all you have to decide whether you want to stay in the same research *field* or you want to change it. Keeping your field allows you to increase your knowledge in a special area. On the other hand, changing the field would broaden your knowledge. If from your doctoral work you know a lot of foreign scientists from the literature and perhaps from personal contacts, it is relatively easy to address those people about

if they have an open post-doc position,

if they might be interested in applying for one,

or if they would like to help to get a fellowship.
In any case, ask your adviser for help. His reputation and his recommendations might be very helpful.

Usually, if somebody has a position to fill in and is interested in you, he/she can request up to three recommendation letters from people who can judge your qualification. Getting an offer usually depends on luck.

Nowadays post-doc positions are also offered in the homepages of universities. Therefore, searching in the internet seems to be quite a convenient way to begin the search.

Invitations, visits, seminars, corresponding

Invitations of scientists working in your field are necessary and very helpful for thorough discussions and to exchange ideas. Usually the invited person gives a talk in form of a seminar. In general, this is necessary in order to finance the guest's travelling costs.

At the beginning of the seminar talk, the guest has to be introduced to the audience. This comprises a short presentation of the speaker's scientific career.

The guest's visit requires some planning, the more the longer the visit is (picking up at the train station, reservation of accommodation, lab tour, discussion meetings, announcement of the seminar talk, activities in the evenings (?), sightseeing tour(?)). Often a visit is followed by a return visit.

Establishing a collaboration

Visits and return visits of scientists are the basis for planning a collaboration. The collaboration may take different forms:

The partner institute produces materials (alloys, single crystals, etc.) or carries out some measurements or calculations which may be complementary or just a test of consistency. Usually no payment but participation in publications of the results or some compensating investigations is requested.

The partner institute allows the use of certain equipment or software. Usually this has to be acknowledged in the publications.

Joint proposals for funding collaboration

If a longer collaboration seems to be fruitful to solve a certain problem, then the thing to do will be to write a joint proposal for funding. There are different possibilities where joint projects may be applied for. The easiest way is at national level. It is getting more and more complicated at European level. Sometimes a partner from industry is requested. From a scientific point of view it is important to make clear that the problem can only be solved jointly. Moreover, the contributions of the different partner institutes have to be stated clearly.

Problems around the ownership of scientific contributions in a collaboration

Generally the company (university, firm) which pays for the work owns the scientific output. Problems arise when there are different contributors. In this case, and particularly when industry is incorporated, agreements have to be made ahead about secrecy and publishing of results.

3. Scientific Curriculum Vitae

When you apply for a post-doc position or when proposals are made for funding a project, you present your C.V. It should be constructed according to the following order:

Personal information
Education
Work experience
Publication list
Animation of scientific life
Teaching
Awards
Extracurricular activities

The **publication list** is especially important. The following order is proposed:

Edited books/Special issues
Archival journal papers
Submitted archival journal papers
Non-archival journal/conference papers
Conference presentations
Patents

Example of a young scientist applying for a post-doc position

CURRICULUM VITAE

NAME Satyam Suwas

PRESENT AFFILIATION Scientist with the *Defence Metallurgical Research Laboratory, Hyderabad (INDIA)*

ADDRESS FOR CORRESPONDENCE C/O Prof. R. K. Ray, Department of Materials & Metallurgical Engineering, I. I. T. Kanpur-208 016 (INDIA)

E - MAIL satyamsuwas@yahoo.com; rkray@iitk.ac.in

DATE OF BIRTH 30th September 1969.

NATIONALITY Indian

EDUCATION (degree onwards)

| Degree | University | Major/ Subjects | Year of Award | Percentage / CPI(/10) | Class |
|----------------|--|--|----------------------|------------------------------|------------------|
| B. Sc. (Hons.) | Ranchi University, Ranchi (India) | Physics (Hons.) Chemistry and Mathematics | 1989 | 70 % | 1st |
| M. Sc. | Banaras Hindu University, Varanasi (India) | Physics (Specialisation: Materials Sci.) | 1991 | 65 % | 1st |
| M.Tech. | Indian Institute of Technology, Kanpur (India) | Materials & Metallurgical Engineering | 1994 | 8.00 (CPI) | No class awarded |
| Ph. D. | Indian Institute of Technology, Kanpur (India) | Materials & Metallurgical Engineering | 1999 | 8.00 (CPI) | No class awarded |

AWARDS/ SCHOLARSHIPS

1. Awarded the Junior Research Fellowship from the Council of Scientific and Industrial Research (CSIR), INDIA (1992)

2. Awarded Dr. Shanker Dayal Sharma Medal for All Round Excellence from I. I. T. Kanpur (1999)

PROJECTS

(M. Sc.)

Investigations on Bismuth doped Thallium bearing High Temperature Superconductors

(Supervisor: Prof. O. N. Srivastava)

(M. Tech.)

Deformation Processing of Iron Aluminides

(Supervisors: Prof. S. Bhargava & Dr. S. Sangal)

(Ph. D.)

Evolution and Stability of Textures during Thermomechanical Processing of Ti-24Al-11Nb Alloy

(Supervisors: Prof. R. K. Ray & Prof. S. Bhargava)

FIELDS OF INTEREST

Crystallographic Texture, Thermomechanical Processing, Structure-Property Relationships (*Please also see Annexure I*)

RESEARCH PUBLICATIONS

Annexure II

EMPLOYMENT DETAILS

| S.NO | EMPLOYING AGENCY | DESIGNATION | TITLE OF THE PROJECT/ DEPARTMENT OF POSTING | DURATION |
|------|--|--------------------------|--|--------------------------|
| 1 | Aeronautics Research and Development Board (INDIA) through The Dean, R & D, IIT Kanpur (INDIA) | Senior Project Associate | Evolution of Texture during processing of Al-Li Alloys and Ti-Aluminides | April 1994- June 1998 |
| 2 | Department of Science and Technology, India through The Dean, R & D, IIT Kanpur (INDIA) | Project Engineer | Development of Iron Aluminides by I/M and P/M Routes | July 1998- December 1998 |
| 3 | Department of Materials & Metallurgical Engineering, IIT Kanpur (INDIA) | Research Associate | Thermomechanical Processing of ($\alpha+\beta$) Titanium Alloys | January 1999- May 1999 |
| 4 | Defence Metallurgical Research Laboratory, | Scientist | X-Ray Diffraction and Texture | June 1999- till date |

| | | |
|--------------------------|--|-------------------|
| Hyderabad (INDIA) | | Laboratory |
|--------------------------|--|-------------------|

| | |
|-------------------------|--|
| MEMBERSHIPS | <ol style="list-style-type: none"> 1. Life Member, Indian Institute of Metals 2. Life Member, Texture Society of India 3. Life Member, Magnetism Society of India |
| NAME OF REFEREES | <ol style="list-style-type: none"> 1. Professor R. K. Ray Department of Materials and Metallurgical Engineering, I. I. T. Kanpur - 208 016 (INDIA) 2. Professor S. Bhargava Department of Materials and Metallurgical Engineering, I. I. T. Kanpur - 208 016 (INDIA) |

ANNEXURE I

1. Academic and Research Experiences

I, as a student of M. Tech. and Ph. D. programmes of I. I. T. Kanpur, have done a number of compulsory and elective courses as curriculum requirement. The *advanced level elective courses* studied by me are as follows: (i) *Textures in Metals and Alloys*, (ii) *Dislocation Theory and Plastic Deformation*, (iii) *Engineering Applications of Dislocations*, (iv) *Modern Trends in Metal Forming Processes*, (v) *Sintering and Sintered Products*, (vi) *Materials Engineering*, (vii) *Structure and Magnetic Properties of Materials*, (viii) *Science and Technology of Magnetic Materials*, (ix) *Preparation and Characterisation of Crystals and (x) Advanced Structural Ceramics*.

In addition to my M. Tech. and Ph. D. dissertations, I have been associated with the sponsored research programs on **(A) Reaction Synthesis of Aluminide Intermetallics**, and **(B) Development of Iron Aluminides** during my stay at I. I. T. Kanpur.

(A) Reaction Synthesis of Aluminide Intermetallics: This research programme on reactive synthesis involved the study of interaction between Solid Metal (Iron, Nickel, Titanium) and Liquid Aluminum under various reaction conditions. The domain of work comprises of reactive synthesis of the respective intermetallics and characterization of the reaction product(s) by X-ray diffraction and electron microscopy.

(B) Development of Iron Aluminides: The programme on iron aluminides includes thermomechanical processing, the study of recrystallization behaviour and order-disorder transformations in some ternary iron aluminides. The work involved microscopic and X-ray characterization of the intermetallics under differently treated conditions.

2. Present Activities:

Presently, as per the requirements of my present employment, I am associated with the programmes on:

- (A) **Development of ($\alpha_2 + \gamma$) based Titanium aluminides:** The work involves estimation of phase equilibria in Ti-Al-Mo and Ti-Al-Nb systems, optimisation of composition and tailoring of microstructures for the processing of these alloys and examination of crystallographic texture.
- (B) **Study of rolling and annealing textures in ($\alpha+\beta$) and β Titanium Alloys:** The study aims at examining the texture evolution as a function of thermomechanical processing parameters in near α -Titanium alloy (IMI 685), near β Titanium alloy (SP-700) and Metastable β Titanium alloy (Ti-10V-1.5Al-3.5 Fe), and
- (C) **Grain refinement and optimisation of texture in some Copper-base alloys.**

Experimental Skills:

I have working experience in X-ray Diffraction, Microscopic Techniques (optical and electron microscopy), Thermomechanical processing (specially hot rolling). I have operated the Siemens D 5000 Diffractometer for Texture Measurement, Philips APD Powder X-ray Diffractometer, JEOL-JSM 840A Scanning Electron Microscope, JEOL-2000Fx Transmission Electron Microscope and many other equipments which are used for the characterization of materials.

In addition to characterization techniques, I also have experience on thermal and thermomechanical processing of materials as well as powder processing.

ANNEXURE II

List of Publications (in peer reviewed Journals and edited Conference Proceedings)

1. **Satyam Suwas** and G. S. Upadhyaya, "Powder Metallurgy Processing of Aluminide Intermetallics", *Metals Materials and Processes*; 1995, Vol. 7, No. 4, pp. 225-250.
2. **Satyam Suwas**, S. Bhargava and S. Sangal, " Morphology of the Boride Phase in a Cast Iron Aluminide Matrix Composite", *Journal of Materials Science Letters*; 1996, Vol. 15, pp. 1216-1218.
3. **Satyam Suwas**, A. K. Singh, R. K. Ray and S. Bhargava, "Textural Changes during Thermomechanical Processing of Ti-24Al-11Nb Alloy", *Scripta Materialia*, 1996, Vol.35, No. 7, pp. 897-902.

4. **Satyam Suwas**, S. Bhargava and S. Sangal, "Effect of Deformation Processing on Microstructural Evolution in a Boron Containing Fe-25Al Intermetallic Alloy", *High Temperature Materials and Processes*, 1997, Vol. 16, No. 1, pp. 29-38.
5. Amit Shyam, **Satyam Suwas** and S. Bhargava, "Microstructural Features of Iron aluminide formed by the Reaction between Solid Iron and Liquid Aluminium", *Practical Metallography*, 1997, Vol. 34, No. 6, pp. 264-277.
6. S. Bhargava, **Satyam Suwas** and M. Sujata, "Particulate Structures of Aluminides and their formation by the Reaction Synthesis", *Proc. International Conference on Recent Advances in Metallurgical Processes*, 1997, pp.665-670.
7. D. Bandyopadhyaya, **Satyam Suwas**, R. M. Singru and S. Bhargava, " Mössbauer Spectroscopic Study of Heat Treated and Control-cooled Fe₃Al Alloy", *Journal of Materials Science*, 1998, Vol. 33, pp. 109-116.
8. R. K. Ray and **Satyam Suwas**, "Texture Evolution in Trimetal Aluminide Intermetallics", *Metals, Materials and Processes*, 1998, Vol.10, No.3, pp.265-286.
9. **Satyam Suwas**, R. K. Ray, A. K. Singh and S. Bhargava, " Evolution of Basal Textures on Hot Rolling of a Two Phase Titanium Aluminide Alloy", in "*Textures in Materials Research*", Oxford & IBH publishing Co. Pvt. Ltd., 1999, pp. 415-437.
10. **Satyam Suwas** and R. K. Ray, "Evolution and Stability of Texture during Thermomechanical Processing of Ti-24Al-11Nb Alloy", *Bulletin of Materials Science*, 1999, Vol. 22, No. 3, pp. 581-584.
11. **Satyam Suwas**, R. K. Ray, A. K. Singh and S. Bhargava, "Evolution of Hot Rolling Textures in a Two-Phase ($\alpha_2+\beta$) Ti₃Al-base Alloy", *Acta Materialia*, Vol. 47, No. 18, pp. 4585-4598.
12. **Satyam Suwas** and R. K. Ray, "Stability of Rolling Texture during Heat Treatment in a Two Phase Ti₃Al Base Intermetallic Alloy", *Acta Materialia*, Vol. 47, No. 18, pp. 4599-4614.
13. **Satyam Suwas** and R. K. Ray, "Effect of Processing Variables on Texture Formation in a Two Phase Ti₃Al-base Alloy, in *Proceedings of the Twelfth International Conference on Texture of Materials (ICOTOM-12)*, 1999, pp. 641-646.
14. **Satyam Suwas** and R. K. Ray, "Thermal Stability of Basal Texture in a Ti₃Al-Base Alloy" in *Proceedings of the Twelfth International Conference on Texture of Materials (ICOTOM-12)*, 1999, pp. 916-921.
15. **Satyam Suwas** and R. K. Ray, "Evolution of Texture in the β (B2) Phase of a Two-Phase Titanium Aluminide Intermetallic Alloy Ti-24Al-11Nb", *Metallurgical and Materials Transactions A*, 2000, Vol. 31A, pp. 2339-2350.

16. R. K. Ray and **Satyam Suwas**, "Development of Crystallographic Texture during Processing of Some Aluminide based Aerospace Materials", *Metals and Materials*, Vol. 6, No. 1, 2000, pp. 39-49.
17. H. C. Verma and **Satyam Suwas**, "Mossbauer Studies of Phase Stability in Mechanically Stressed Fe-28 at% Al", *Journal of Magnetism and Magnetic Materials*, Vol. 212, 2000, pp. 361-367.
18. **Satyam Suwas**, A. K. Singh and R. K. Ray, "Texture in Titanium and its Alloys", *Titanium*, 2000, Vol. 5, No. 2, pp. 1-10.
19. **Satyam Suwas** and R. K. Ray, "Effect of Rolling on Texture of Primary and Secondary α_2 Produced by the Thermomechanical Processing of a Ti-24Al-11Nb Alloy", *Scripta Materialia*, 2001, Vol. 44, pp. 275-280.
20. R. Gopalan, K. Muraleedharan, T. S. R. K. Sastry, **S. Suwas**, V. Joshi and V. Chandrasekaran, "Structural Investigations in 2:17 Type SmCo Alloys", *Transactions of the Materials research Society of Japan*, 2001, Vol. 26, No. 3.
21. **Satyam Suwas**, T. K. Nandy, V. V. Bhanu Prasad, S. V. Kamat and D. Banerjee, "Development of an orthorhombic aluminide based laminated composite", *Proceedings of the International Symposium on Structural Intermetallics ISSI-3, 2001, TMS, Warrandale PA*
22. K. Mallikarjun, **Satyam Suwas**, S. Ghosh Chowdhury and S. Bhargava, "Effect of prior β processing steps on microstructural refinement during thermomechanical processing of a two phase ($\alpha+\beta$) Titanium Alloy (*communicated to Materials Science and Technology*).
23. K. Mallikarjun, **Satyam Suwas** and S. Bhargava, "Effect of prior β processing on superplasticity of ($\alpha+\beta$) thermomechanically treated Ti-632Si alloy" (*communicated to J. Mater. Proc. Technol.*).
24. M. Sujata, S. Bhargava, **Satyam Suwas** and S. Sangal, "On Ti_9Al_{23} formation during interaction between solid Ti and liquid Al" (*communicated to J. Alloys and Compounds*).
25. M. Sujata, S. Bhargava, **Satyam Suwas** and S. Sangal, "On kinetics of $TiAl_3$ formation during reaction synthesis from solid Ti and liquid Al" (*communicated to J. Mater. Sci. Letters*).
26. **Satyam Suwas** and R. K. Ray, "Textural and Microstructural Evolution in the O and α_2 phases derived by ageing of the β phase in a Ti-24Al-11Nb alloy" (*communicated to J. Mater. Proc. Technol.*).

27. Brajesh Pandey, **Satyam Suwas** and H.C.Verma, "Phase Transformations in $\text{Fe}_{(72-x)}\text{Al}_{28}\text{Ti}_x$ ($x = 0, 2, 6, 9$) Alloys induced by Mechanical Stress" (*communicated to Journal of Magnetism and Magnetic Materials*).
28. **Satyam Suwas**, A. K. Singh and R. K. Ray, "Evolution of hot rolling textures and microstructures in the orthorhombic 'O' phase of a two phase (O+B2) Ti-22Al-25Nb alloy" (*under preparation*).
29. **Satyam Suwas** and R. K. Ray "Evolution of Texture during Processing of Titanium and Titanium Alloys" (*under preparation for International Materials Review- Synopsis Accepted*).

Conference Presentations:

1. **Satyam Suwas**, S. Sangal and S. Bhargava, "Deformation Processing of Boron Modified Fe_3Al Alloy"; presented in International Conference on Structural Intermetallics, Materials Research Society of India, Hyderabad (INDIA), Feb. 1994.
2. **Satyam Suwas**, A. Agarwal, S. Bhargava and S. Sangal, " Effect of Thermomechanical Treatment on Microstructural Evolution and Tensile Properties of Boron-free and Boron modified Fe_3Al base Intermetallic Alloys" presented in National Seminar on Titanium and Superalloys, organised by The Hyderabad chapter and the Non-Ferrous Division of the Indian Institute of Metals, July 1996.
3. **Satyam Suwas**, "Substitution of Titanium Alloys with Advanced Materials" presented in "Suitability, Testing and Selection of Metallic Materials for Indigenisation of Aviation Components" organised by Aeronautical Society of India (UP & Bihar Chapter), Kanpur, Oct. 18, 1998 (*Invited Lecture*).
4. **Satyam Suwas**, R. K. Ray, A. K. Singh and S. Bhargava, "Evolution of Microstructure and Texture in Ti-24Al-11Nb Intermetallic Alloy", presented in 53rd Annual Technical Meeting of The Indian Institute of Metals, Nov. 14-17, 1999, Kanpur.
5. K. Mallikarjun Baburao, **Satyam Suwas** and S. Bhargava, "Effect of Thermomechanical Processing on Superplastic Behaviour of a Two Phase ($\alpha+\beta$) Ti-Alloy", presented in 53rd Annual Technical Meeting of The Indian Institute of Metals, Nov. 14-17, 1999, Kanpur.
6. M. Sujata, **Satyam Suwas** and S. Bhargava, "Aluminide formation during Reaction Synthesis of Liquid Al and Solid Ti", presented in 53rd Annual Technical Meeting of The Indian Institute of Metals, Nov. 14-17 1999, Kanpur.
7. **Satyam Suwas**, A. K. Singh, R. K. Ray and S. Bhargava, "Textural changes during $\beta \rightarrow \alpha_2$ transformation in a β hot rolled Ti-24Al-11Nb alloy", presented in International

Symposium on Hexagonal Days II held at University of Metz, Metz, France, Nov. 22-26, 1999.

8. **Satyam Suwas** and R. K. Ray, “Textural and Microstructural Evolution in the O and α_2 phases derived by ageing of the β phase in a Ti-24Al-11Nb alloy” presented in 54th Annual Technical Meeting of The Indian Institute of Metals, Nov. 14-17, 2000, Bhilai.
9. **Satyam Suwas**, A. K. Singh, R. K. Ray and S. Bhargava, “Transformation Textures in a β hot rolled Ti₃Al base alloy” presented in 54th Annual Technical Meeting of The Indian Institute of Metals, Nov. 14-17, 2000, Bhilai.