

## **4. Manufacturing Science**

**Japanese Coordinator:**

**Prof. Manabu Kiuchi**  
**Professor**  
**Teikyo Heisei University**

**Indian Coordinator:**

**Prof. SG Dhande**  
**Director**  
**Indian Institute of Technology,**  
**Kanpur**

## Manufacturing Science

### 【 Coordinators 】

Japanese Coordinator	Indian Coordinator
Prof. Manabu Kiuchi Professor Teikyo Heisei University	Prof. Amitabha Ghosh Director Indian Institute of Technology Kanpur

### Overviews and Future Plan

#### 【FY2002-2003 Overview】

In the fiscal years of 2002 and 2003, 4 times of Japan-India Joint –Seminars were held in the field of Manufacturing Science as the continuation of past 8 years.

In 2002, “The 6<sup>th</sup> Joint-Seminar on Advanced Manufacturing Systems” and “The 8<sup>th</sup> Joint-Seminar on Advanced Composites” were held in India. At the parallel sessions of these seminars, 20 technical papers were presented by researchers from universities of both countries. However, no attendants were from the Industry: Fruitful discussions were made concerning each paper and useful suggestions and advices were given to every presenter. Very effective exchange of knowledge and information was carried out and the objectives of Joint-Seminars were completely accomplished.

In 2003, “The 7<sup>th</sup> Joint-Seminar on Advanced Manufacturing Systems” and “The 9<sup>th</sup> Joint-Seminar on Advanced Composites” were held in Japan. At the parallel sessions of these seminars, roughly 30 research and/or review papers were presented by not only the formal academic members of Japan-India Collaboration Program, but also the special guests invited from Japanese industries. Very good discussions were made concerning each paper and very useful suggestions and advices were given to every presenter. The objectives of two Joint-Seminars were effectively accomplished.

#### 【FY2004-2005 Future Plan】

Two series of Joint-Seminars will be continued in the fiscal years of 2004 and 2005.

In FY2004, “The 8<sup>th</sup> Joint-Seminar on Advanced Manufacturing Systems” and “The 10<sup>th</sup> Joint-Seminar on Advanced Composites” will be held in India. The dates of the seminars will be from Feb. 21<sup>st</sup> (Mon) to 26<sup>th</sup> (Sat), 2005.

In FY2004, a new group will start a small Joint-Seminar on “ Micro Manufacturing Technology ” in the field of Manufacturing Science. This group will initiate a new series of “ Joint Seminar ”.

It will continue to FY 2005 and furthermore.

In 2005, therefore, three Joint-Seminars will be organized by Japanese team and held in Japan. The time and place will be decided when Japanese and Indian teams meet together in next Feb.

#### 【 Summary 】

Through past 10 years including FY2002 and FY2003, the collaboration program between Japan and India were promoted energetically in the field of Manufacturing Science. In the continuation of two series of seminars, a large number of researchers of both countries deepened mutual understanding. The main results obtained in these years can be summarized as follows.

1. The variation of topics discussed in the seminars is still expanding. This means that two series

of seminars are expanding their domains and frontiers. Through joining the seminars, the researchers of both countries are expanding their research fields and activities.

2. The total number of researchers of both countries who joined two series of seminars is steadily increasing. This means that this collaboration program has effectively contributed to widen multi-lateral relationships among Japanese and Indian researchers.
3. It should be pointed out that the number of young researchers who joined the seminars is increasing. The increase of young participants is expected to result in expansion of future-oriented collaboration.
4. It can be concluded that Japan-India collaboration program in the field of Manufacturing Science is generating the meaningful results steadily. It has provided so many joined researcher with precious opportunity to innovate their research works on various manufacturing processes and technologies that will be very much useful for further development of both countries,

This program definitely contributes to further collaboration between Japan and India. It works as a very valuable channel between two countries to promote joint-works among researchers of both countries. Year by year, the role of the program is becoming more and more important. It is expected to continue to the future.



FY	1998	1999	2000	2001	2002	2003	2004
Joint Research							
Seminar	The 5th India-Japan Seminar on Composites, Oct.19-24, Tokyo I: 6m/48md		Manufacturing Science of Advanced				
		The 4th India-Japan Seminar on Feb.20-25,Kharagpur J: 6m/43md		Advanced Manufacturing System,			
		The 6th India-Japan Seminar on Composites, Feb.21-26, Kharagpur J: 6m/48md		Manufacturing Science of Advanced			
			The 5th India-Japan Seminar on Sep.2-8,Japan J: 6m/12md I: 5m/40md		Advanced Manufacturing System,		
			The 7th India-Japan Seminar on Composites, Sep2-8,Japan J: 7m/17md I: 5m/39md		Manufacturing Science of Advanced		
			The 6th India-Japan Seminar on Nov.30-Dec.7,India		Advanced Manufacturing System, J: 6m/48md		
			The 8th India-Japan Seminar on Composites, Dec1-7,India		Manufacturing Science of Advanced J: 6m/48md		
			The 7th India-Japan Seminar on Feb.16-21,Japan		Advanced Manufacturing System, J: 6m/36md I: 6m/42md		
			The 9th India-Japan Seminar on Feb.16-21,Japan		Advanced Manufacturing Composites, J: 7m/34md I: 6m/48md		
					The 8th India-Japan Seminar on Advanced Manufacturing System		
				The 10th Anniversary Japan-India Joint Seminar on Advanced Composites Manufacturing Science			
Visiting Scientist	J: 1m/8md	I: 1m/11md		I: 1m/15md			
Total	J: 1m/8md I:12m/96md	J: 12m/91md I: 1m/11md		J: 13m/29md I: 11m/94md	J: 12m/96md	J: 13m/70md I: 12m/90md	

## Report

### 1. Seminars

<b>1-1 Seminar 1</b>	
Title	The 5 <sup>th</sup> Japan-India Joint Seminar on Advanced Manufacturing Systems
Japanese Organizer	Prof. Manabu Kiuchi, Professor, Teikyo Heisei University
Indian Organizer	Prof. Amitabha Ghosh Professor, Indian Institute of Technology, Kharagpur
Period & Place	From 2 September, 2001 to 8 September, 2001      Japan
<b>Objectives :</b> The seminar aimed to promote the exchange of knowledge and information necessary and useful for advancement and innovation of R & D activities in the field of “Manufacturing Science” in Japan and India. “Manufacturing Science” covers analysis, design, simulation, realization, test and evaluation of manufacturing processes, machines, tools, materials and systems. It is the fundamental for all of societies as well as industries. This seminar’s objective was to contribute to the enhancement of R & D activities for the future of industries in both countries.	
<b>Accomplishment Status :</b> At the seminar, 16 papers were presented. The title of them were as follows, <ul style="list-style-type: none"><li>• Mass Production of Al Suspension parts using FSW for Automotive Industry</li><li>• Fracture Prediction in Metal Forming Processes</li><li>• Eccentric and Oblique Axis Spinning Technology</li><li>• Culture of Manufacturing Organizations, a Comparative Study</li><li>• Development of Layered Manufacturing System Using FDM-ECD</li><li>• Present and Near Future Perspectives of Contact Pattern Measurement</li><li>• Prediction of Porosity Contents and Examination of Porosity Formation in Al-4. 4%Mg DC SLAB</li><li>• Development of the Injection-Press Molding for Plastic Body Panels</li><li>• An Approach for Predetermined Land Wear Monitoring in Turning</li><li>• Current State of the Art in Milti-Axis Control Machining</li><li>• Development of HVM630 High-Speed Machining Center Using Linear Motors</li><li>• High Precision Control of Circular Trajectory by Disturbance Cancellation</li><li>• Three Dimensional Massively Parallel Structures</li><li>• Torsion Strength of Assembled Camshaft by Shave Joining and Main Influencing Factors on It</li><li>• Prediction of Quench Distortion on Steel Shaft with Keyway by Computer Simulation</li><li>• A New Mathematical Model to Simulate Flow of Mushy/ Semi-Solid Alloys</li></ul> The most important point of this seminar was that some special speakers were invited from Japanese industries. They presented their experiences and results concerning updated manufacturing processes and products. They introduced various newest topics in machine tool industry, automobile component industry, material industry and machine building industry. They provided the precious knowledge and information to all of the attendants concerning the noticeable products of advanced Japanese industries. As the result, the attendants could refresh their knowledge and elevate their potential for future oriented R & D activities.	
<b>Program :</b> <b><u>3 September (Mon)</u></b> 9:00- 9:10    Opening Ceremony 9:00-12:10    4sessions 12:10-13:30    Lunch 13:30-16:30    4sessions	

**4 September (Tue)**

9:00- 12:00 4sessions

12:00-13:20 Lunch

13:20-16:20 4sessions

16:20-17:00 Round Table

**List of Participants :**

## From Japan

Manabu Kiuchi	Professor, Teikyo Heisei University
Yoshimi Ito	Professor Emeritus, Tokyo Institute of Technology
Junichi Endo	Professor, Department of Mechanical System Engineering, Kanagawa Institute of Technology
Makoto Murata	Associate Professor, Department of Mechanical Engineering and Intelligent Systems, University of Electro-Communications
Jun Yanagimoto	Associate Professor, Institute of Industrial Science, University of Tokyo
Shinichi Warisawa	Lecturer, Department of Mechanical Engineering, University of Tokyo

## From India

Amitaba Ghosh	Professor, Indian Institute of Technology, Kharagpur
V. Radhakrishnan	Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras
Sanat Kumar Mukherjee	Vice-Chancellor, Birla Institute of Technology-Mesra Ranchi
Sudipot Mukherjee	Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology, Delhi
NallagundlaVenkataReddy	Assistant Professor, Department of Mechanical Engineering, Indian Institute of Technology, Kanpur

<b>1-2 Seminar2</b>	
Title	The 7 <sup>th</sup> Japan-India Joint Seminar on Manufacturing Science of Advanced Composites
Japanese Organizer	Prof. Terufumi Machida, Professor, Engineering School, Tamagawa University
Indian Organizer	Prof. Niranjana K. Naik, Professor, Indian Institute of Technology, Bombay
Period & Place	From 2 September, 2001 to 8 September, 2001      Japan
<p><b>Objectives :</b>  The seminar aimed to promote the exchange of up-to-date knowledge and information necessary for activation and innovation of R&amp;D on “Recent Movements of ACM Manufacturing Science” in both countries. The scope and topics of the seminar are (1) Composite Materials (FRP, MMC, C/C, etc.), (2) Production System, (3) Testing &amp; Evaluation, (4) Applications, (5) Fastening &amp; Joining, (6) Parts &amp; Performance, (7) National Project, (8) Industrial Situation, (9) The Others, as the past six seminars.</p> <p><b>Accomplishment Status :</b>  Since the beginning of collaboration program, the seminar has seen fruitful joint works to establish the novel science &amp; technology for the 21<sup>st</sup> Century. Seven Japanese scientists (formal) and five Indian scientists were invited to present the results of recent work and to discuss with the audience. All delegates have sufficiently achieved the given purpose through beautiful presentations and especially, Indians experienced the useful inspection tours to Japanese Institutions and Plants. The exchanged information has been really suggestible for the progress of science and technology. Also the colleagues really deepened the mutual understanding and relationships. They wanted the next seminar to be held in India in 2002.</p>	
<p><b>Program :</b>  <u><b>3 September (Mon)</b></u>  9:00- 9:30    Opening Address  9:30- 12:00    Session1  12:00-13:30    Lunch  13:30-15:00    Session2  15:00-15:30    Coffee Break  15:30-17:00    Session3  18:00-20:00    Reception</p> <p><u><b>4 September (Tue)</b></u>  9:00- 9:30    Meeting  9:30- 12:00    Session4  12:00-13:30    Lunch  13:30-15:00    Session5  15:00-15:30    Coffee Break  15:30-17:00    Session6  17:00-17:10    Closing Address by Coordinators</p>	



**List of Participants :**

## From Japan

Terufumi Machida	Professor, Engineering School, Tamagawa University
Hiroshi Hatta	Professor, Institute of Space and Astronautical Science
Ken Goto	Assistant, Institute of Space and Astronautical Science
Hideaki Kasano	Professor, Takushoku University
Kenji Morii	Professor, Graduate School, Division of Engineering, Osaka Prefecture University
Tsunemichi Imai	Senior Research Scientist, National Institute of Advanced Industrial Science and Technology
Toshihiko Mori	Associate Professor, School of Engineering, Nagoya University
Takuya Aoki	Researcher, National Aerospace Laboratory

## From India

N.K. Naik	Professor, Indian Institute of Technology, Bombay
R.M.V.G.K. Rao	Professor, National Aerospace Laboratories
S.S. Joshi	Assistant Professor, Indian Institute of Technology, Bombay
P.K. Mishra	Professor, Indian Institute of Technology, Kharagpur
S.N. Ojha	Professor, Institute of Technology, Banaras Hindu University

<b>1-3 Seminar3</b>											
Title	The 6 <sup>th</sup> Japan-India Joint Seminar on Advanced Manufacturing Systems										
Japanese Organizer	Prof. Manabu Kiuchi, Professor, Teikyo Heisei University										
Indian Organizer	Prof. Amitabha Ghosh, Professor, Indian Institute of Technology, Kharagpur										
Period & Place	From 30 November 2002 to 7 December, 2002      India										
<p><b>Objectives :</b></p> <p>The seminar aimed to promote the exchange of knowledge and information necessary and useful for advancement and innovation of R &amp; D activities in the field of “Manufacturing Science” in Japan and India. “Manufacturing Science” covers analysis, design, simulation, realization, test and evaluation of manufacturing processes, machines, tools, materials and systems. It is the fundamental for all of societies as well as industries. This seminar’s objective was to contribute to the enhancement of R &amp; D activities for the future of industries in both countries.</p> <p><b>Accomplishment Status :</b></p> <p>The following 12 papers were presented at the seminar.</p> <ul style="list-style-type: none"> <li>• Mushy/Semi-Solid Metal Forming Technology-Present and Future</li> <li>• Rapid Product Development of Freeform Shapes using Reverse</li> <li>• Active and Passive Contributions of Production Technologies to Society of Near Future</li> <li>• Modeling and Analysis of Abrasive Water Jet Cutting Process</li> <li>• Application of Capacitive Displacement Transducer to the Measurement of Die Deformation in Forging</li> <li>• Realization of a 1-D Massively Parallel Binary Structure</li> <li>• Kindly Deep Drawing for Environment Using High-Pressured Water</li> <li>• Shape Realizing Ability of Machined Parts Accounting for Machine Tool Quasi-Static Errors</li> <li>• Design Concept for a Circulatory Manufacturing System for a Sustainable Society Using Genetic Product Information</li> <li>• Some Issues in Thermo-Fluid Modeling of a Laser Surface Alloying Process</li> <li>• Product and Process Design System for Deep Drawing of Cylindrical Cups</li> <li>• Edge Rounding Method by Means of Water Jet for Cylindrical Rollers of Bearing</li> </ul> <p>The papers deal with various new manufacturing, testing and measuring technologies as well as principles. Mushy/semi-solid metal forming, reverse engineering for rapid product development, application of water jet cutting, measurement of die deformation, methodology of product and process design, parallel binary structure, evaluation of machine tool errors, circulatory manufacturing system, environmentally conscious deep drawing and relationships between manufacturing technology and society.</p> <p>The seminar had a limited number of attendants (15 persons) from the academic sectors of both countries. All of discussions, therefore, were made mainly from the fundamental and scientific viewpoints. Due to the situation like this, the session could deepen the understanding of the problems very effectively. Exchange of serious comments and criticisms could generate future oriented precious advices and proposals to each other. Consequently, every person could elevate his consciousness to aim more extensive communication with others relating to each one’s R&amp;D activities.</p>											
<p><b>Program :</b></p> <p>Nov. 30, 2002 (Saturday)    Arrival</p> <p>Dec 1, 2002 (Sunday)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">08:30 AM</td> <td style="width: 50%;">Starting from Delhi</td> </tr> <tr> <td>07:30 PM</td> <td>Inauguration at Mussorie</td> </tr> <tr> <td>08:00 PM</td> <td>Dinner</td> </tr> </table> <p>Dec 2, 2002 (Monday)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">09:00 AM – 12:40 PM</td> <td style="width: 50%;">5sessions</td> </tr> <tr> <td>12:40 PM – 02:00 PM</td> <td>Lunch</td> </tr> </table>		08:30 AM	Starting from Delhi	07:30 PM	Inauguration at Mussorie	08:00 PM	Dinner	09:00 AM – 12:40 PM	5sessions	12:40 PM – 02:00 PM	Lunch
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08:00 PM	Dinner										
09:00 AM – 12:40 PM	5sessions										
12:40 PM – 02:00 PM	Lunch										

02:00PM-08:00PM 08:00 PM	4sessions Dinner
Dec 3, 2002 (Tuesday)	
09:00 AM – 10:45 AM	3sessions
10:45 AM – 11:15 AM	Tea
11:15 AM – 04:30 PM	Visit to Camp-tea Falls, Picnic at Dhanolti (Lunch & Tea)
05:30 PM	Back to Mussorie
08:00 PM	Dinner
Dec 4, 2002 (Wednesday)	
09:00 AM – 11:50 AM	3sessions
11:50 AM – 05 :00 PM	Lunch & Industry visit (Dehradum), Back to Mussorie
08:00 PM	Dinner
Dec 5, 2002 (Thursday)	
06:00 AM	Mussorie to Haridwar for BHEL visit
08:15 AM	Breakfast
09:00 AM – 01:00 PM	BHEL visit
01:00 PM – 02:00 PM	Lunch at BHEL
02:00 PM	Starting from Haridwar to Delhi
08:30 PM	Dinner in Delhi
Dec 6, 2002 (Friday)	
Industrial visit and sight seeing in Delhi	
04:00 PM	Departure of Japanese team

**List of Participants :**

From Japan

Manabu Kiuchi	Professor, Teikyo Heisei University
Yoshimi Ito	Professor Emeritus, Tokyo Institute of Technology
Junichi Endo	Professor, Department of Mechanical System Engineering, Kanagawa Institute of Technology
Makoto Murata	Associate Professor, Department of Mechanical Engineering and Intelligent Systems, University of Electro-Communications
Yoshimi Murata	Associate Professor, Institute of Industrial Science, University of Tokyo
Shinichi Warisawa	Lecturer, Department of Mechanical Engineering, University of Tokyo

From India

Amitaba Ghosh	Professor, Indian Institute of Technology, Kharagpur
V. Radhakrishnan	Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras
Sudipot Mukherjee	Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology, Delhi
Nallagundla Venkata Reddy	Assistant Professor, Department of Mechanical Engineering, Indian Institute of Technology, Kanpur
Ramesh Babu	Professor, Department of Mechanical Engineering, Indian Institute of Technology, Madras
Suman Chakraborty	Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur
V.V.S.N.S. Yugandara Rao P	Project Associate, Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur
D.R. Prasada Raju	Advisor, Scientist-G, Department Science and Technology, government of India
B.N.Mondal	Doctor, Central Mechanical Engineering Research Institut

<b>1-4 Seminar4</b>	
Title	The 8 <sup>th</sup> Japan-India Joint Seminar on Manufacturing Science of Advanced Composites
Japanese Organizer	Prof. Terufumi Machida, Professor, Engineering School, Tamagawa University
Indian Organizer	Prof. Niranjana K. Naik, Professor, Indian Institute of Technology, Bombay
Period & Place	From 1 December, 2002 to 7 December, 2002 Japan
<p><b>Objectives :</b> The seminar was held as the continuation and extension of the past seminars. Six Japanese scientists, including four new members, and eight Indian scientists discussed on the recent R &amp; D results to extend their own capacity further for the future activity.</p> <p><b>Accomplishment Status :</b> All delegates have sufficiently achieved the given purpose through beautiful presentations and useful inspection tours to Indian Institutions and Plants. Especially in this seminar, both delegates were much impressed in that Dr. R. Sharma, Director, International Division, DST, talked about the thought of such the project and present states in India. All members friendly discussed on the useful information for advancement of the ACM manufacturing science and the industries. The leaders agreed that such the substantial collaboration should be continued hereafter and the 9<sup>th</sup> conference was to be held in Tokyo in middle February 2004. Also the other collaboration such as scientists and academic exchange between Institutions &amp; Universities, and visiting or mailing for transfer of promising technological knowledge will be obtained more often than before.</p>	
<p><b>Program :</b>  <u><b>2 December (Mon)</b></u>  Opening Address  Session1(3presentations)  Lunch  Session2(2presentations)  Coffee Break  Session3(2presentations)  Session4(1presentation)  <u><b>3 December (Tue)</b></u>  Meeting  Session5(3presentations)  Lunch  Session6(3presentations)  Coffee Break  General Discussions  Closing Address by Coordinators</p>	
<p><b>List of Participants :</b>  From Japan  Terufumi Machida                      Professor, Engineering School, Tamagawa University  Hiroshi Hatta                            Professor, Institute of Space and Astronautical Science  Takashi Ishikawa                      Professor, School of Engineering, Nagoya University  Hiroshi Suemasu                        Professor, Faculty of Science and Technology, Sophia University  Eiichi Aoyama                            Professor, Faculty of Engineering, Doshisha University  Kiyotaka Matsuura                      Assistant, Hokkaido University</p> <p>From India  N.K. Naik                                    Professor, Indian Institute of Technology, Bombay  R.M.V.G.K. Rao                           Professor, National Aerospace Laboratory</p>	

S.S. Joshi	Professor, Indian Institute of Technology, Bombay
S.N. Ojha	Professor, Institute of Technology, Banaras Hindu University
N. Bhatnager	Professor, Mechanical Engineering Department, Indian Institute of Technology, Delhi
Kishore	Professor, Polymer Composites Laboratory, Indian Institute of Science
B. Mondal	Doctor, Central Mechanical Engineering Research Institute
R. Sharma	Director, International Division, Department of Science and Technology

<b>1-5 Seminar 5</b>	
Title	The 7 <sup>th</sup> Japan-India Joint Seminar on Advanced Manufacturing Systems
Japanese Organizer	Prof. Manabu Kiuchi, Professor, Teikyo Heisei University
Indian Organizer	Prof. Amitabha Ghosh, Professor, Indian Institute of Technology, Kharagpur
Period & Place	From 16 February, 2004 to 21 February, 2004 Japan
<p><b>Objectives :</b>  The 7<sup>th</sup> seminar aims to promote the exchange of knowledge and information necessary and useful for advancement and innovation of R&amp;D activities in the field of “Manufacturing Science” in Japan and India. “Manufacturing Science” covers analysis, design, simulation, operation, test and evaluation of manufacturing processes, machines, tools, materials and systems. The objective of this seminar is to contribute to the enhancement of R&amp;D activities for the future of manufacturing industries in both countries.</p> <p><b>Accomplishment Status :</b>  At the 7th Seminar, 14 technical papers were presented by not only the formal members of the Collaboration Program, but also the special guests invited from Japanese industries. The topics presented at the seminar are as follows. (1) Ductile mode cutting of glass material, (2) Finish turning process optimization, (3) Aluminum die casting for automobiles, (4) Energy flow in cycle system, (5) 3-D flow analysis of mold filling process, (6) Aluminum casting alloy in Japan, (7) Advanced rheo-casting process, (8) Recent development in injection modeling technology, (9) Parts integration technology for aluminum vehicle body, (10) Tube hydro-forming in Japan, (11) Adaptive control of abrasive water cutting, (12) Die-less bending of tubes, (13) Prediction of LDR, (14) Micro-scale fluid flow and heat transfer.</p> <p>As known from these topics, the field of manufacturing system and technology covered by the seminar is now widely spread. Various new processes and technologies are introduced, explained and discussed at the seminar. All of the attendants could obtain so many new knowledge and information. Such experiences were thought to be definitely useful for them in order to innovate their research works and activities. It was concluded that the seminar had been successfully performed and the objectives to share knowledge and stimulate each other were effectively accomplished. Furthermore, the seminar provided the attendants with an opportunity to discuss the possibility to initiate a new series of Joint-Seminar on micro manufacturing technology.</p> <p>In addition, the 7th seminar accepted 20 young guests from 10 Asian countries. They attended all of the sessions of the seminar. They also presented reports on their research works and were given comments, suggestions and advices. It was very precious opportunity for each of them to find out new directions for their activities. Thus the 7th seminar played very important roles to support young researchers in Asian countries.</p>	

**Program :**

Feb 16(Monday)

8:45~9:00 —Opening Address

9:30~11:55 —5sessions

11:55~13:30—Lunch

13:30~15:20—4sessions

15:20~15:40—Break

15:40~17:30—3sessions

Feb 17 (Tuesday)

9:00~10:20 —4sessions

10:20~10:40—Break

10:40~12:00—2sessions

12:00~13:00—Lunch

13:00~15:20—4sessions

15:20~15:40—Break

15:40~18:40—9sessions

**List of Participants :**

From Japan

Manabu Kiuchi

Professor, Teikyo Heisei University

Yoshimi Ito

Professor Emeritus, Tokyo Institute of Technology

Junichi Endo

Professor, Department of Mechanical System Engineering,  
Kanagawa Institute of Technology

Makoto Murata

Associate Professor, Department of Mechanical Engineering and  
Intelligent Systems, University of Electro-Communications

Shinichi Warisawa

Lecturer, Department of Mechanical Engineering, University of  
Tokyo

Takashi Kuboki

Associate Professor, The University of Electro-Communications

From India

Amitaba Ghosh

Professor, Indian Institute of Technology, Kharagpur

V. Radhakrishnan

Professor, Department of Mechanical Engineering, Indian Institute  
of Technology, Madras

Sudipot Mukherjee

Associate Professor, Department of Mechanical Engineering, Indian  
Institute of Technology, Delhi

Nallagundla Venkata Reddy

Assistant Professor, Department of Mechanical Engineering, Indian  
Institute of Technology, Kanpur

Ramesh Babu

Professor, Department of Mechanical Engineering, Indian Institute  
of Technology, Madras

Suman Chakraborty

Associate Professor, Department of Mechanical Engineering, Indian  
Institute of Technology, Kharagpur

Dr. U.S. Dixit

Department of Mechanical Engineering, Indian Institute of  
Technology, Guwahati-721 302, India

<b>1-6 Seminar 6</b>	
Title	The 9 <sup>th</sup> Japan-India Joint Seminar on Manufacturing Science of Advanced Composites
Japanese Organizer	Prof. Terufumi Machida, Professor, Engineering School, Tamagawa University
Indian Organizer	Prof. Niranjana K. Naik, Professor, Indian Institute of Technology, Bombay
Period & Place	From 16 February, 2004 to 21 February, 2004      Japan
<p><b>Objectives :</b> The seminar aimed to promote the exchange of up-to-date knowledge and information necessary for activation and innovation of R&amp;D on “Recent Movements of ACM Manufacturing Science” in both countries.</p> <p><b>Accomplishment Status :</b> The delegates have sufficiently obtained the given purpose through beautiful presentations and the useful inspection tours to Institutions and Plants. Especially the delegates discussed on the expansion in the manufacturing science and industries of ACM for the last decade, new and progressed subjects, and the plan for the 10<sup>th</sup> anniversary seminar and next collaboration. The exchanged information has been really suggestible to expand the application and possibility of ACM. Also we have really deepened the mutual understanding and relationships. To brighten the next generations we should collaborate with the spirit of program, hereafter.</p>	
<p><b>Program :</b> Feb 16 (Monday) 8:45~9:00 —Opening Address 9:00~10:40 —session 1 10:50~12:10—session 2 13:30~15:30—session 3 16:05~17:30—session 4 18:00~20:00—Reception Feb 17 (Tuesday) 9:00~10:20 —session 5 10:50~12:10—session 6 13:00~15:30—sessions 7</p>	
<p><b>List of Participants :</b> From Japan Terufumi Machida      Professor, Engineering School, Tamagawa University Hiroshi Hatta      Professor, Institute of Space and Astronautical Science Tsunemichi Imai      Senior Research Scientist, National Institute of Advanced Industrial Science and Technology  Hiroshi Suemasu      Professor, Faculty of Science and Technology, Sophia University Hiroshi Tsuda      Lecturer, Osaka Prefecture University Kiyotaka Matsuura      Associate Professor, Hokkaido University Katsuhiko Yamaguchi      Professor, Department of Mechanical Engineering, Kyoto Institute of Technology  From India N.K. Naik      Professor, Indian Institute of Technology, Bombay S.S. Joshi      Professor, Indian Institute of Technology, Bombay S.N. Ojha      Professor, Institute of Technology, Banaras Hindu University Kishore      Professor, Polymer Composites Laboratory, Indian Institute of Science  B. Mondal      Doctor, Central Mechanical Engineering Research Institute P. K. Mishra      Professor, Indian Institute of Technology - Kharagpur</p>	



<b>1-7 Seminar 7</b>																											
Title	The 8 <sup>th</sup> Japan-India Joint Seminar on Advanced Manufacturing System																										
Japanese Organizer	Prof. Manabu Kiuchi, Professor, Teikyo Heisei University																										
Indian Organizer	Prof. Amitabha Ghosh, Professor, Indian Institute of Technology, Kharagpur																										
Period & Place	From 21 February, 2005 to 26 February, 2005 India																										
<p><b>Objectives :</b>  The 8th seminar aims to promote more active exchange of knowledge and information concerning leading manufacturing processes and innovative technologies that will be useful for each member of the Collaboration Program to develop his research activities.</p> <p>In addition, the 8th seminar has two special objectives. One is to accept some new researchers as the formal members of the Joint Seminar on behalf of old ones. New blood would be necessary and effective for activating the Collaboration Program. Second one is to initiate a new series of Joint Seminar on micro manufacturing technologies. This time 34 researchers from each of Japan and India will join this new seminar. Micro manufacturing is becoming one of leading industries in the world. The development of it would be indispensable for both of Japan and India. It is very good timing to start a new joint seminar on that topic and it will be meaningful for both Japan and India to continue it to the future.</p>																											
<p><b>Program :</b>  Feb20 Arrival  Feb 21 Sessions  Feb 22 Sessions and Receptions  Feb 23 Industrial visit 1  Feb24 Industrial visit 2  Feb25 Industrial visit 3  Feb26 Industrial visit and sight seeing in Delhi, Departure of Japanese team  Feb27 Arrival</p>																											
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<b>1-8 Seminar8</b>																																	
Title	The 10 <sup>th</sup> Anniversary Japan-India Joint Seminar on Advanced Composites Manufacturing Science (10 <sup>th</sup> ACM-Seminar)																																
Japanese Organizer	Prof. Terufumi Machida, Professor, Engineering School, Tamagawa University																																
Indian Organizer	Prof. Niranjana K. Naik, Professor, Indian Institute of Technology, Bombay																																
Period & Place	From 21 February, 2005 to 26 February, 2005 India																																
<p><b>Objectives :</b>  We have already experienced many fruitful joint works to confirm the ACM science &amp; technology for the future of both countries. The 10<sup>th</sup> Anniversary seminar aims to promote the exchange of up-to-date knowledge and information necessary for activation and innovation of R&amp;D on "Recent Movements of ACM Manufacturing Science" in both countries. All delegates will have fruitful discussions and inspection tours.  The scope and topics are as follows;</p> <ol style="list-style-type: none"> <li>(1) Composite Materials (Goal: reinforcing and/or performance, Filler: whisker, fiber, particle, and hybrid, Mother: plastics, metals, ceramics, and carbon, Structure: macro- and/or microscopic)</li> <li>(2) Fabrication &amp; Production System</li> <li>(3) Testing &amp; Evaluation</li> <li>(4) Applications</li> <li>(5) Fastening &amp; Joining</li> <li>(6) Parts &amp; Performance</li> <li>(7) National Project</li> <li>(8) Industrial Situation</li> <li>(9) The Others Related</li> </ol>																																	
<p><b>Program :</b>  Monday Feb.21 - Tuesday Feb.22, 2005: Conference (Paper sessions) at Indian Institute of Technology-Kanpur  Wednesday Feb.23 - Saturday Feb. 27, 2005: Inspection Tours and Meeting</p>																																	
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## 2. Visiting Scientists for Information Exchange

India to Japan

Name & Affiliation	Research Subject	Main Host Researcher	Period
Prof. P.K. Mishra Indian Institute of Technology, Kharagpur	Study on the Techniques in the Use of Micro-EDM and Fabrication of Micro-Tools for Micro Drilling/Milling Operations	Prof. Takahisa Masuzawa Professor Centre for International Research on Micro Mechatronics University of Tokyo	24 Feb.2002- 10 Mar.2002 (15 days)