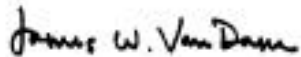


**TO:** Executive Secretaries of the US-Japan Fusion Research Collaboration  
**FROM:** Steering Committee, US-Japan Joint Institute for Fusion Theory (JIFT)  
**DATE:** May 16, 2003  
**SUBJECT:** JIFT Annual Report of Activities for 2002-2003

CONTENTS:

*Annual Report of JIFT Activities*



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# Annual Report of Activities

## US-Japan Joint Institute for Fusion Theory

April 1, 2002–March 31, 2003

submitted by the

### **JIFT Steering Committee**

*Co-Chairmen:* James W. Van Dam, Masao Okamoto, and Atsushi Fukuyama

*US Co-Executive Secretary:* Frank L. Waelbroeck

May 16, 2003

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## 1. INTRODUCTION

The Joint Institute for Fusion Theory (JIFT) is one of the three programs through which the US-Japan Fusion Research Collaboration is organized. The other two programs are the Fusion Physics Planning Committee (FPPC) and the Fusion Technology Planning Committee (FTPC).

The distinctive objectives of the JIFT program are (1) to advance the theoretical understanding of plasmas, with special emphasis on stability, equilibrium, heating, and transport in magnetic fusion systems; and (2) to develop fundamental theoretical and computational tools and concepts for understanding nonlinear plasma phenomena. Both objectives are pursued through collaborations between U.S. and Japanese scientists by means of three types of exchange program activities—namely, workshops, exchange visitors, and joint computational projects.

Each year the JIFT program usually consists of four topical workshops (two in each country), six exchange scientists (three from each country), and a fluctuating number of joint computational projects (on the order of a dozen). So far, during its 22 years of successful operation, JIFT has sponsored 125 long-term visits by exchange scientists, 79 topical workshops, and 135 joint computational projects.

- The *workshops* typically have an attendance of 15–30 participants, of whom usually three to seven scientists (depending on the particular workshop) travel to the workshop from the non-host country. Scientists from countries other than the U.S. and Japan are also often invited to participate in JIFT workshops, either as observers or multi-laterals.
- Of the approximately three *exchange visitors* in each direction every year, one (called the “JIFT Visiting Professor”) is supported by the host country, while the others (called “Exchange Scientists”) are supported by the sending country. The visits of the Exchange Scientists usually last from several weeks to a month or two in duration, whereas the Visiting Professors normally stay for three months.
- The third category of JIFT exchange activities consists of *joint computational projects*. In general these are continuing collaborations on various problems of current interest, which initially develop out of interactions at workshops and through individual exchange visits.

The topics and also the participating scientists for the JIFT exchange visits, workshops, and joint computational projects are selected so as to have a balanced representation of critical issues in magnetic fusion research, including both fundamental problems as well as questions of near-term significance, and also to take into account the specific capabilities and interests of both countries. The Japanese and US members of the JIFT Steering Committee agree together on the appropriateness of proposed topics before recommending them.

## 2. STATUS OF CURRENT ACTIVITIES (2002-2003 PROGRAM)

Almost all of the activities in the three categories—workshops, personal exchanges, and joint computational projects—that had been scheduled for the 2002-2003 JIFT program were carried out during the past year. All four workshops were successfully held, in addition to the JIFT Steering Committee meeting. In the category of personal exchanges, one Visiting Professor and five Visiting Scientists made exchange visits, while three other exchange visits were deferred. The JIFT joint computational projects were also active.

The JIFT activities for the past year (April 1, 2002–March 31, 2003) are listed below, with brief annotations concerning attendance, location, and dates.

### A. 2002-2003 Workshops

#### US to Japan:

- JF1-01 *Structural Formation and Drift Wave/MHD Turbulence*  
Organizers: Masatoshi Yagi (Kyushu U.) and Patrick Diamond (UCSD)  
Kyushu U., Fukuoka, Japan; September 11–13, 2002
- JF1-02 *New Development of Simulation Science*  
Organizers: Tomohiko Watanabe (NIFS) and William Tang (PPPL)  
Graduate University for Advanced Studies, Kanagawa, Japan; March 5–8, 2003

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**Japan to US:**

- JF1-06 *Theoretical Consideration on Helical Plasmas*  
Organizers: Noriyoshi Nakajima (NIFS) and Donald Monticello (PPPL)  
Princeton, NJ; November 18–21, 2002
- JF1-07 *Particle Simulation and Parallelization*  
Organizers: Seiji Ishiguro (NIFS), James Van Dam (IFS Texas), Jean-Noel Leboeuf and Viktor Decyk (UCLA)  
UCLA, Los Angeles, CA; May 16–17, 2002  
(in conjunction with the Dawson Symposium, May 18, 2002)
- JF1-08 *JIFT Steering Committee Meeting-1*  
Organizers: Masao Okamoto (NIFS); James Van Dam (IFS)  
UCLA, Los Angeles, CA, May 17, 2002
- JF1-14 *JIFT Steering Committee Meeting-2*  
Organizers: Atsushi Fukuyama (Kyoto U); James Van Dam (IFS)  
APS/DPP Meeting, Orlando, FL, November 12, 2002

**B. 2002-2003 Exchange Visits**

**Japan to US:**

- JF1-09 *Study on the Zonal Flow Effect on Plasma Microturbulence*  
Masatoshi Yagi (Kyushu U.), Visiting Scientist  
PPPL and UCSD; January 26–February 2, 2003 (one week); paid by Japan
- JF1-10 *Kinetic Simulation Study on Drift Wave Turbulence*  
Tomohiko Watanabe (NIFS), Visiting Professor  
IFS; October 14–November 17, 2002 (one month); paid by US (IFS)
- JF1-11 *Effects of Vortex Generation on the Kinetic Internal Kink Mode*  
Hiroshi Naitou (Yamaguchi U.), Visiting Scientist  
UCLA; August 2–September 30, 2002 (two months); paid by Japan
- JF1-12 *Basic Study for 3-Dimensional Analysis of Divertor Plasma*  
Arimichi Takayama (NIFS), Visiting Scientist  
UCSD; January 8–February 21, 2003 (two months); paid by Japan

**US to Japan:**

- JF1-03 *Analysis of Micro-Instabilities in LHD and JT-60U Plasmas*  
Greg Rewoldt (PPPL), Visiting Scientist  
NIFS and JAERI; June 22–July 5, 2002 (2 weeks); paid by US  
(deferred from October 2001, due to terrorist attack of 9/11/01)
- JF1-04 *LHD High Beta Plasma Analysis*  
Guoyong Fu (PPPL), Visiting Scientist  
NIFS and JAERI; deferred to next year
- JF1-05 *Physics Consideration on New Helical System*  
Ming-Sheng Chu (GA), Visiting Scientist  
NIFS, JAERI, Kyoto; deferred to next year

**C. 2002-2003 Joint Computational Projects**

- JF2-15 *MHD Stability in Advanced Tokamaks*  
S. Tokuda, Y. Ishii, M. Ozeki, and M. Azumi (JAERI);  
J. Manickam (PPPL), A. Aydemir (IFS)  
1 week; 1 person to US; continued from 2001-2002

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- JF2-06 *Gyrokinetic Transport Simulation*  
V. Decyk, R. Sydora (UCLA), W. Lee (PPPL);  
T. Takayama (NIFS), H. Naitou (Yamaguchi)  
2 weeks; 1 person to Japan; continued from 2001-2002
- JF2-07 *Plasma Rotation, Vortices, and Anomalous Transport*  
W. Horton, A. Aydemir, K. Shaing (IFS), B. Carreras (ORNL);  
M. Okamoto, S. Murakami (NIFS), M. Wakatani (Kyoto)  
3 weeks; 1 person to Japan; continued from 2001-2002
- JF2-16 *3-D Codes and Island Formation*  
A. Boozer (Columbia); D. Monticello (PPPL); C. Hegna (Wisc.);  
T. Hayashi, R. Kanno (NIFS), Y. Nakamura (Kyoto U.)  
2 weeks; 1 person to US; continued from 2001-2002
- JF2-17 *New Simulation Algorithms for Massively Parallel Processing*  
V. Decyk (UCLA), W. Tang (PPPL);  
K. Watanabe, R. Horiuchi, S. Ishiguro (NIFS)  
2 weeks; 1 person to US; continued from 2001-2002
- JF2-18 *Toroidal Simulation and Plasma Transport Modeling*  
W. Horton (IFS); Y. Kishimoto, A. Azumi (JAERI), H. Takamaru(NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-19 *Numerical Study of High Energy Particle Effect on MHD Stability*  
C.Z. Cheng (PPPL), J. Van Dam (IFS); M. Azumi, T. Ozeki (JAERI), Y. Todo (NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-20 *Turbulent Transport Applications to Tokamaks and Helical Systems*  
B. Carreras (ORNL); W. Horton (IFS)  
M. Wakatani and Y. Nakamura (Kyoto); M. Yokoyama (NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-21 *Tokamak Simulation on Massively Parallel Computers*  
B. Carreras, D. Spong (ORNL), J.N. Leboeuf, V. Decyk (UCLA);  
S. Tokuda, G. Kurita (JAERI), T. Watanabe (NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-22 *MHD and Transport Phenomena in Toroidal Systems*  
W. Tang, G. Rewoldt, C.Z. Cheng (PPPL); H. Sugama, and R. Ishizaki (NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-23 *Kinetic Effects on MHD Phenomena*  
J. Van Dam, H. Berk (IFS); M. Okamoto, N. Nakajima, K. Ichiguchi (NIFS)  
1 week; 1 person to US; continued from 2001-2002
- JF2-24 *Two-Fluid Model for Plasma Simulation*  
B. Coppi, T. Takaya, L. Sugiyama (MIT); T. Hayashi (NIFS)  
1 week; 1 person to US; continued from 2001-2002

### 3. TECHNICAL PROGRESS HIGHLIGHTS

The four 2002-2003 JIFT *workshops* were on topics of timely interest and had stimulating participation by both theoretical and computational scientists, as well as some experimentalists.

- The workshop on *Structural Formation and Drift/MHD Turbulence* was held jointly with the *Symposium on Transport and Structural Formation*, which covered interdisciplinary fields such as fusion, space plasma physics, oceanography, and meteorology. Half of the presentations were related to fusion physics, and the other presentations were interdisciplinary. One topic was transport phenomena in oceans and atmospheres; examples that were discussed included the super rotation of Venus, oil spills in the Sea of Japan, the Baiu front for the Japanese rainy season, and the mixing barrier in the stratospheric polar vortex. Interestingly, the internal transport barrier observed in tokamak plasmas exhibits features that are similar to those of the mixing barrier in the Earth's ozone hole. Another topic was dynamo problems, such as magnetic helicity in

the solar corona, large-scale magnetic fields in astrophysical objects, and helicity transport and Taylor relaxation. Related to this topic, singular perturbations in two-fluid theory were also discussed, including Taylor relaxation theory. A third topic was transport phenomena in fusion plasmas, such as theory for plasma turbulence and structure formation, transport barrier formation, zonal flow formation in drift wave turbulence, and intense relativistic electron beam transport in dense plasmas. Physics topics in the new physics category of high energy density physics and astrophysics with intense lasers were also presented. This workshop provided an excellent opportunity for interdisciplinary communication, which is creative and fruitful for magnetic fusion theory.

- The workshop on *New Development of Simulation Science* was held at Hayama during March 5-7 and in Tokyo on March 8 jointly with the *Eighth Soken-Dai International Symposium on Simulation Science: New Methodology of Science in the 21st Century* with the aim of exploring interdisciplinary possibilities for simulation science as a new scientific methodology in the 21st century. Several review talks on recent developments in simulation research were presented from a variety of scientific areas, such as astrophysics, space science, geodynamo, climate research, fusion science, bioscience, and quantum dynamics. A few sessions were devoted to advanced computing techniques for simulation research. The workshop stimulated mutual interests among various fields of simulation science and promoted understanding of developments in this rapidly growing area. Hence this workshop was fruitful for simulation research on fusion plasmas.
- The workshop on *Theoretical Considerations on Helical Plasmas* was hosted by Princeton Plasma Physics Laboratory, November 18-21, 2002, the week after the APS/DPP Meeting. Six Japanese scientists participated in the workshop. The 16 talks presented at the workshop focused primarily on theoretical considerations of currently operating stellarators (LHD, Heliotron-J, W7-AS and HSX) and on future experiments (such as QPS, W7-X and NCSX). The entire proceedings of the workshop are posted on the web at <http://www.pppl.gov/ncsx/Scientificconf/JIFT/JIFT.html>. A synopsis of the talks will be published in *Stellarator News* (<http://www.ornl.gov/fed/stelnews/>).
- The workshop on *Particle Simulation and Parallelization* was held at the University of California, Los Angeles, May 16-17, 2002 (<http://www.physics.ucla.edu/dawson/workshop.html>). It immediately preceded a special symposium on March 18 that was held to honor the memory of Prof. John Dawson, who had died in November 2001 after a long and distinguished career in fusion plasma physics. Prof. Dawson served as a member of the JIFT Steering Committee since the establishment of the JIFT program more than twenty years ago. He was very active in visiting Japan and collaborating with Japanese scientists. For this reason, a large number of Japanese (8) participated in the JIFT workshop and two more came for the memorial symposium. Among the topics covered at the JIFT workshop were nonlinear MHD and gyrokinetic transport simulations of toroidal plasmas, distributed computing, aneutronic torsatron/stellarator fusion reactor, semiclassical modeling of quantum mechanics, wakefield acceleration, fluid and particle simulations for plasma applications, self-organization in kinetic plasmas, and laser-plasma interactions (see the agenda at [http://www.physics.ucla.edu/dawson/dawson\\_schedule.html](http://www.physics.ucla.edu/dawson/dawson_schedule.html)).

The JIFT *exchange visits* during 2002-2003 have also been productive, in terms of collaborations established, research accomplished, and papers written. Here we mention a few highlights.

- *Dr. Hiroshi Naitou* (Yamaguchi U) visited UCLA for two months. Collaborating with Dr. Jean-Noel Leboeuf, he investigated the effects of vortex generation on the kinetic internal kink mode. By using the cylindrical gyro-reduced MHD code GRM3F-CY, he found that the linear mode structure of the kinetic internal kink mode in the presence of a density gradient has sheared-poloidal flow and that, in the nonlinear stage, Kelvin-Helmholtz instability can generate vortices. These vortices are believed to be crucial for understanding sawtooth crash phenomena. The extension to the toroidal model is urgent. To this end, gyro-reduced MHD equations were implemented in the toroidal MHD FAR code (kinetic FAR). Linear results from the kinetic FAR code in the cylindrical limit agree with the results of GRM3F-CY. The toroidal calculation is now ready to be done.
- *Dr. Tomohiko Watanabe* (NIFS) visited IFS for four weeks. He worked with IFS scientists on kinetic simulations of ion temperature gradient-driven turbulence, as well as a fluid closure model with kinetic effects. This work was fruitful for gaining new understanding of fundamental aspects of kinetic plasma turbulent transport, such as the steady and quasi-steady states of turbulence. He also started a new research collaboration with Dr. W. Horton and Dr. H. V. Wong concerning a closure model for collisionless magnetohydrodynamic equations. This collaboration will continue between NIFS and IFS.
- *Dr. Masatoshi Yagi* (Kyushu U.) visited PPPL. He worked on a kinetic-fluid model for multiple-scale

turbulence, such as ion temperature gradient-driven drift wave (ITG) turbulence and short wave length ITG turbulence. He showed numerically that the non-adiabatic electron response produces a particle pinch effect. The model was also extended to sheared-slab geometry.

- *Dr. Arimichi Takayama* (NIFS) visited UCSD for six weeks and collaborated with Dr. Sergei Krasheninnikov and Dr. A. Pigarov to study the divertor region in the Large Helical Device by use of the 2D multi-fluid transport code UEDGE. The UEDGE code was applied to an effective magnetic flux surface configuration that represents major features of the LHD edge region. Some preliminary results were obtained.
- *Dr. Gregory Rewoldt* (PPPL) visited JAERI and NIFS for two weeks, continuing his investigations of micro-instabilities in tokamak and torsatron plasmas. He worked on comparing results from code simulations with experimental results from JT-60U and LHD.

Twelve JIFT *joint computational projects* on various topics were also active during the past year. Some of these projects involved limited travel.

#### 4. PROGRAM ADMINISTRATION

JIFT has a Steering Committee consisting of eight members, four from each country. Two of these members are the Japanese and US co-chairmen. Two other members of the Steering Committee, the US and Japanese co-executive secretaries, are responsible for the ongoing daily oversight of the progress of JIFT activities. The co-chairman and co-executive secretary on the US side are, respectively, the director and assistant director of the Institute for Fusion Studies (IFS) of The University of Texas at Austin. The Japanese co-chairman has been the director of the Theory and Computer Simulation Center at the National Institute for Fusion Studies. Furthermore, on the Japanese side there is one official Advisor, who is from the Japan Atomic Energy Research Institute; and on the US side there is an Advisory Committee comprised of several members representing a spectrum of US universities and national laboratories. The names of the persons on the Steering Committee and the names of the Advisors are listed below:

##### JIFT Steering Committee

###### *US Members*

J. Van Dam (IFS)—Co-Chairman  
F. Waelbroeck (IFS)—Co-Exec. Secretary  
J. Leboeuf (UCLA)  
M. Crisp (DOE)

###### *Japanese Members*

M. Okamoto (NIFS)—Co-Chairman  
A. Fukuyama (Kyoto U)—Co-Chairman  
K. Mima (Osaka U.)

##### JIFT Advisors

*Japanese Advisor:* Y. Kishimoto (JAERI)

*US Advisory Committee:* A. Aydemir (IFS), P. Catto (MIT), B. Carreras (ORNL), V. Chan (GA), B. Cohen (LLNL), W. Horton (IFS), W. Tang (PPPL), and P. Terry (UWM)

Several changes in the composition of the JIFT Steering Committee occurred during the past year. At the end of March 2002, Dr. Tetsuya Sato left his positions as director of the Theory and Simulation Center at NIFS and also as the Japanese-co-chairman of JIFT. Dr. Masao Okamoto (NIFS), who had been the Japanese co-executive secretary, replaced him as Japanese-co-chairmen, and Dr. Atsushi Fukuyama (Kyoto U) joined the Steering Committee as another Japanese-co chairman. Also, Dr. Jean-Noel Leboeuf (UCLA), who had been a member of the US Advisory Committee, was selected to become a new US member of the Steering Committee as the replacement for Dr. John Dawson. Finally, Dr. Masahiro Wakatani, a member of the JIFT Steering Committee for over ten years, suddenly passed away in January 2003; he had played a very important role, not only in the JIFT program, but also in the overall US-Japan Fusion Research Collaboration, and his leadership and contributions over the years were invaluable. The JIFT Steering Committee helped write an obituary in his memory, which will be published in *Physics Today*.

The JIFT Steering Committee attempts to schedule workshops in such a way as to dovetail with other meetings. It also tries to involve participation at workshops by interested experimentalists and to invite relevant available scientists from other countries to attend workshops.

As the principal program for fundamental theoretical exchanges in the US-Japan Fusion Research Collaboration, JIFT operates alongside the Fusion Physics Planning Committee (FPPC) and the Fusion Technology Planning Committee (FTPC). In particular, the JIFT activities are coordinated with the four FPPC areas of activity, viz., core

plasma phenomena, edge behavior and control, heating and current drive, and new approaches and diagnostics.

Note that information about the JIFT program, including annual schedules of exchange activities, can be found on the new JIFT web site at <http://peaches.ph.utexas.edu/jift/>.

## 5. RECENT JIFT-RELATED PUBLICATIONS

Below are listed a number of papers that either have been or will be published in connection with JIFT activities. Note that JIFT-sponsored collaborations led to two invited papers at the biennial IAEA Fusion Energy Conference last year.

- V. I. Berezhiani, S. M. Mahajan, Z. Yoshida, and M. Ohhashi, "Self-trapping of strong electromagnetic beams in relativistic plasmas," *Phys. Rev. E* **65** (4), 047402 (2002).
- V. I. Berezhiani, S. M. Mahajan, Z. Yoshida, and M. Pekker, "Dynamics of self-trapped singular beams in an underdense plasma," *Phys. Rev. E* **65** (4), 046415 (2002).
- J. Q. Dong, H. Sanuki, K. Itoh and Liu Chen, "Electron temperature gradient instability in toroidal plasmas," *Phys. Plasmas* **9**, 4699 (2002).
- W. Horton, F. Porcelli, P. Zhu, A. Aydemir, Y. Kishimoto, and T. Tajima, "IGNITOR physics assessment and confinement projections," *Nucl. Fusion* **42**, 169-179 (2002).
- A. Ito, Z. Yoshida, T. Tatsuno, S. Ohsaki, and S.M. Mahajan, "Kelvin-Helmholtz instability in Beltrami fields," *Phys. Plasmas* **9** (12), 4856-4862 (2002).
- S. M. Mahajan, R. D.Hazeltine, and Z. Yoshida, "General Fluid Theories, Variational Principles and Self-Organization," in *Fusion Energy: 19th Conference Proceedings, Lyon, France, 14-19 October 2002* (International Atomic Energy Agency, Vienna, to be published), Paper TH/P1-10.
- Swadesh M. Mahajan, Komunela I. Nikol'skaya, Nana L. Shatashvili, and Zensho Yoshida, "Generation of flows in the solar atmosphere due to magnetofluid coupling," *Astrophys. J.* **576**, L161-164 (2002).
- H. Naitou, T. Kobayashi, M. Yagi, T. Matsumoto, S. Tokuda, Y. Kishimoto, and J.-N. Leboeuf, "Interaction between MHD modes and vortexes," in *Proc. of 6th Kyushu-Okinawa-Yamaguchi Branch Division Meeting of Japan Society of Plasma Science and Nuclear Fusion Research* (Saga, Japan, 13 December, 2002), pp.17-20.
- S. Ohsaki, N. Shatashvili, Z. Yoshida, S. Mahajan, "Energy transformation mechanism in the solar atmosphere associated with magnetofluid coupling: explosive and eruptive events," *Astrophysical Journal* **570**, 395-407 (2002)
- S. Ohsaki, N. Shatashvili, Z. Yoshida, and S. Mahajan, "Magnetofluid coupling: Eruptive events in the solar corona," *Astrophysical Journal* **559**, L61-L65 (2001)
- H. Sugama, T.-H. Watanabe, and W. Horton, "Comparison between kinetic and fluid simulations of slab ion temperature gradient driven turbulence," *Phys. Plasmas* **10**, 726 (2003).
- Y. Todo, H. L. Berk, and B. N. Breizman, "Simulation study of beam ion loss due to Alfvén eigenmode bursts," in *Fusion Energy: 19th Conference Proceedings, Lyon, France, 14-19 October 2002* (International Atomic Energy Agency, Vienna, to be published), Paper TH/P3-18.
- Francesco Volponi, Swadesh M. Mahajan, and Zensho Yoshida, "Asymptotic analysis and renormalized perturbation theory of the non-Hermitian dynamics of an inviscid vortex," *Phys. Rev. E* **64**, 026312 (2001).
- T.-H. Watanabe, H. Sugama, W. Horton, and H.V. Wong, "A non-dissipative closure model for mirror instability in a collisionless plasma," in *Proc. of the Sherwood Fusion Theory Conference (2003)*, paper 2C46.
- Z. Yoshida and S. M. Mahajan, "Variational principles and self-organization in two-fluid plasmas," *Phys. Rev. Lett.* **88** (9), 095001-1 – 095001-4 (2002).

## 6. PLANS FOR FUTURE ACTIVITIES (PROPOSED 2003-2004 PROGRAM)

The topics and themes of the exchange activities that have been proposed for the next year (April 1, 2003–March 31, 2004) are consistent with the traditional emphasis of JIFT on fundamental theoretical plasma physics issues. At the same time the proposed activities have direct relevance to the fusion science programmatic interests of both



countries. The schedule of proposed activities for the coming year (2003-2004) is listed below.

### A. 2003-2004 Proposed Workshops

#### US to Japan:

- JF1-01 *Theoretical and Numerical Progress of Fusion Plasmas*  
Organizers: Noriyoshi Nakajima (NIFS) and Donald Monticello (PPPL)  
Proposed Place/Time: NIFS, Toki, Japan; December 3-5, 2003
- JF1-02 *Theory-Based Modeling and Integrated Simulation of Burning Plasmas*  
Organizers: Atsushi Fukuyama (Kyoto U), Jean-Noel Leboeuf (UCLA), and James Van Dam (IFS Texas)  
Proposed Place/Time: Kyoto University, Kyoto, Japan; December 15-17, 2003
- JF1-11 *JIFT Steering Committee Meeting*  
Organizers: Masao Okamoto (NIFS); James Van Dam (IFS)  
Proposed Place/Time: NIFS, Toki, Japan; December 12, 2003

#### Japan to US:

- JF1-05 *Scope of Simulation Science*  
Organizers: Ritoku Horiuchi (NIFS) and Oleg Batishchev (MIT)  
Proposed Place/Time: Cape Cod, MA; September 7-10, 2003  
(in conjunction with the 18th International Conference on Numerical Simulation of Plasmas)
- JF1-06 *Structure Formation in Plasma and Fluid Turbulence*  
Organizers: Masatoshi Yagi (Kyushu U), and Patrick Diamond (UCSD)  
Proposed Place/Time: UCSD, San Diego, CA; September 16-21, 2003

### B. 2003-2004 Proposed Exchange Visits

#### Japan to US:

- JF1-07 *Study on the Zonal Flow Effect on Plasma Microturbulence*  
Masatoshi Yagi (Kyushu U), Visiting Scientist  
PPPL, UCSD; January 22–February 1, 2004 (ten days); paid by Japan
- JF1-08 *Study of Kinetic MHD Modes Due to Kinetic FAR Code*  
Hiroshi Naitou (Yamaguchi U.), Visiting Professor  
UCLA; August 10–September 10, 2002 (one month); paid by US (UCLA)
- JF1-09 *Simulation Study of RF Heating and Energetic Particle Transport*  
Sadayoshi Murakami (Kyoto U), Visiting Scientist  
GA; July 1–July 10 (10 days); paid by Japan
- JF1-10 *Singularities in Plasma with Flow and Stability Analysis*  
Shouichi Osaki (Tokyo U), Visiting Scientist  
IFS; July 1–September 30, 2003 (three months); paid by Japan

#### US to Japan:

- JF1-04 *Study on Peripheral and Divertor Plasma*  
Sergei Krasheninnikov (UCSD), Visiting Professor  
NIFS; September 2–December 25, 2002 (four months); paid by Japan
- JF1-03 *Relaxation Dynamics of an Incompressible Plasma Using Beltrami Function Expansion with Application to Compact Toroids*  
Loren C. Steinhauer (U Washington), Visiting Scientist  
Niigata U; May 4–17, 2003 (two weeks); paid by US
- JF1-12 *Analysis of Micro-instability in LHD and JT-60U Plasmas*  
Greg Rewoldt (PPPL), Visiting Scientist  
NIFS and JAERI; summer, 2003 (two weeks); paid by US
- JF1-13 *LHD High Beta Plasma Analysis*  
Guoyong Fu (PPPL), Visiting Scientist  
NIFS and JAERI; fall 2003, (two weeks); paid by US  
(deferred from last year)

- JF1-14 *Resistive Wall Mode in General Geometry*  
M. S. Chu (General Atomics), Visiting Scientist  
NIFS, Kyoto U, & JAERI; February 28–March 27, 2004 (one month); paid by US  
(deferred from last year)

### C. 2003-2004 Proposed Joint Computational Projects

- JF2-01 *Gyrokinetic Transport Simulation*  
V. Decyk, R. Sydora (UCLA), W. Lee (PPPL);  
T. Takayama (NIFS), H. Naitou (Yamaguchi)  
2 weeks; 1 person to Japan; continued from 2002-2003
- JF2-02 *Plasma Rotation, Vortices, and Anomalous Transport*  
W. Horton, A. Aydemir (IFS), B. Carreras (ORNL);  
M. Okamoto, H. Sugama (NIFS), S. Murakami (Kyoto)  
3 weeks; 1 person to Japan; continued from 2002-2003
- JF2-03 *MHD Stability in Advanced Tokamaks*  
M. Ozeki, Y. Ishii (JAERI), Y. Tomita (NIFS);  
J. Manickam (PPPL), A. Aydemir (IFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-04 *New Simulation Algorithms for Massively Parallel Processing*  
V. Decyk (UCLA), W. Tang (PPPL);  
K. Watanabe, R. Horiuchi, S. Ishiguro (NIFS)  
2 weeks; 1 person to US; continued from 2002-2003
- JF2-06 *Toroidal Simulation and Plasma Transport Modeling*  
W. Horton (IFS);  
Y. Kishimoto, A. Azumi (JAERI), H. Takamaru (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-07 *Numerical Study of High Energy Particle Effect on MHD Stability*  
C.Z. Cheng (PPPL), J. Van Dam (IFS);  
M. Azumi, T. Ozeki (JAERI), Y. Todo (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-08 *Turbulent Transport Applications to Tokamaks and Helical Systems*  
B. Carreras (ORNL); W. Horton (IFS)  
Y. Nakamura (Kyoto); M. Yokoyama (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-09 *Tokamak Simulation on Massively Parallel Computers*  
B. Carreras, D. Spong (ORNL), J.N. Leboeuf, V. Decyk (UCLA);  
S. Tokuda, F. Kurita (JAERI), T. Watanabe (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-10 *MHD and Transport Phenomena in Toroidal Systems*  
W. Tang, G. Rewoldt, C.Z. Cheng (PPPL);  
H. Sugama, R. Ishizaki (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-11 *Kinetic Effects on MHD Phenomena*  
J. Van Dam, H. Berk (IFS);  
M. Okamoto, N. Nakajima, K. Ichiguchi (NIFS)  
1 week; 1 person to US; continued from 2002-2003
- JF2-12 *Benchmarking Kinetic Stability Code for Toroidal Devices*  
G. Rewoldt (PPPL);  
Y. Idomura (JAERI), A. Fukuyama (Kyoto)  
8 weeks; 1 person to US; new