Report on the 50th Spring Meeting (2003) of The Japan Society of Applied Physics and Related Societies

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The 50th Spring Meeting (2003) of The Japan Society of Applied Physics and Related Societies (JSAP) was held over four days from March 27th (Thurs.) to 30th (Sun.), 2003, at the Yokohama Campus of Kanagawa University (Yokohama City). Despite the continuing economic slump, this year's meeting was the largest ever in terms of the number of presentations, with a total of 4,663 lectures (4,072 contributed papers and 591 invited talks given at symposiums and topical sessions). The number of registered participants also far exceeded expectations at 9,117 (the fourth largest turnout at a JSAP Meeting), further contributing to the great success of the event.

Figure 1 shows the movement in the scale of JSAP's Spring and Fall Meetings since 1970. JSAP Meetings grew rapidly in the 1980s, and the number of papers increased from 3,000 to 8,000 per year. This is a reflection of the brisk pace of R&D activities in semiconductor-related fields (silicon, compound semiconductors, and crystal engineering) conducted through universities and in the industrial world. In the 90s, the number of papers reached a saturation point and then began to fall off, as though to match the maturation of this field. As clearly shown in Figure 1, however, the number of presentations at the JSAP Meetings began to increase once again after 2000. This is clear evidence of the beginnings of fetal movement in new research fields in the context of Applied Physics.

Papers for this Meeting were collected in 15 separate fields referred to as "Main Classifications." Figure 2 shows the breakdown for these fields in a comparison with Fall and Spring Meetings held ten years ago. We also conducted a more detailed statistical analysis for each of the individual fields in which papers were accepted; Table 1 is a summary of the fields characterized by the most significant increases in the number of papers submitted over the last three years. As these results clearly indicate, among the various research activities covered by JSAP, the fields of Organic Molecular Electronics and Bioelectronics have demonstrated exceptionally rapid growth. In response to the increased activity in research and development with a view toward organic electroluminescence (EL) in addition to electronic device applications, e.g., field effect transistors (FETs), a new session with a focus on "Organic Devices" was established. This new session was so well received at all of the venues that participants were willing to stand well after the seating limitations had been surpassed. The field of Quantum Electronics has also demonstrated exceptional growth. Particularly in the session on "Photonic Nano-Structures and Relating Phenomena," which has been offered since the Spring Meeting in 2001, discussions focus mainly on photonic crystals, but recently there has been an increasing number of presentations relating to plasmons in metals as well as near-field and black body radiation control, with an accompanying increase in both the quality and quantity of results derived from waveguide, resonator, and laser applications. The number of presentations on "Laser Processing" has gradually increased in recent years as well. The increase in research activities in this field was particularly apparent at this year's Meeting, where presentations on femtosecond laser processing alone accounted for 29 of the total.

In the past, research presentations on carbon nanotubes (CNT) at JSAP Meetings had been divided into five main classifications, each

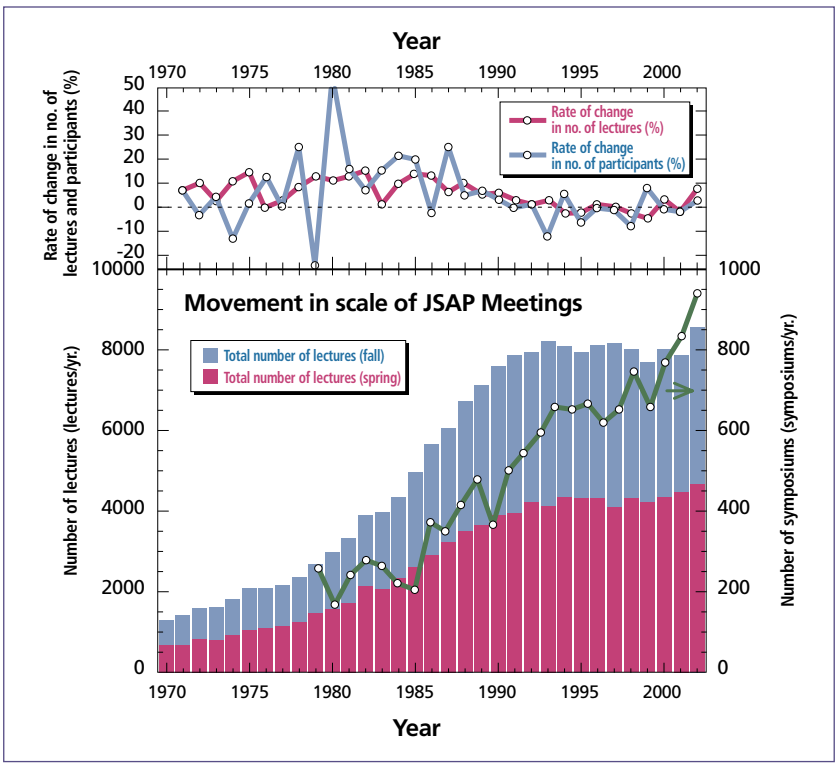

Fig. 1: Rate of change in number of lectures, number of symposiums and other invited lectures (calculated at 15 minutes per lecture), and number of lectures with number of participants at JSAP Meetings. The number of lectures per year is calculated as the number from the Fall Meeting of the previous year (e.g., 2003 Spring Meeting is combined with the 2002 Fall Meeting for the 2002 total) because the deadline for applications for the Spring Meeting is at the beginning of January. The rapid growth in the 1980s is mainly due to an increase in the number of papers from the semiconductor field. The number of papers reached a saturation point in the 90s and then began to show a diminishing trend, but began to increase once again after 2000.

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with a different perspective; for example, production processes, applications as electron sources or nanoprobes, or electronics applications. Starting from the Spring 2003 Meeting, however, we established a joint session on "Carbon Nanotubes: Foundations and Applications," which cuts across several classifications. The goal of establishing this new session was to take advantage of JSAP's unique ability to cover a broad range of fields, from growth technologies and fundamental materials to various types of device applications, and by doing so to promote interaction among researchers and to add even greater impetus to research in these fields. The number of presentations far exceeded expectations, with a total of 89 presentations (two by invited speakers). Related sessions were set up throughout the full four days of the Meeting; "Standing Room Only" status on each day gave a clear indication of the degree of interest in this field. In terms of the number of presentations, this was Japan's largest academic conference related to carbon nanotubes, a situation which has led to expectations that JSAP will play a central role in CNT research in the true sense of the term.

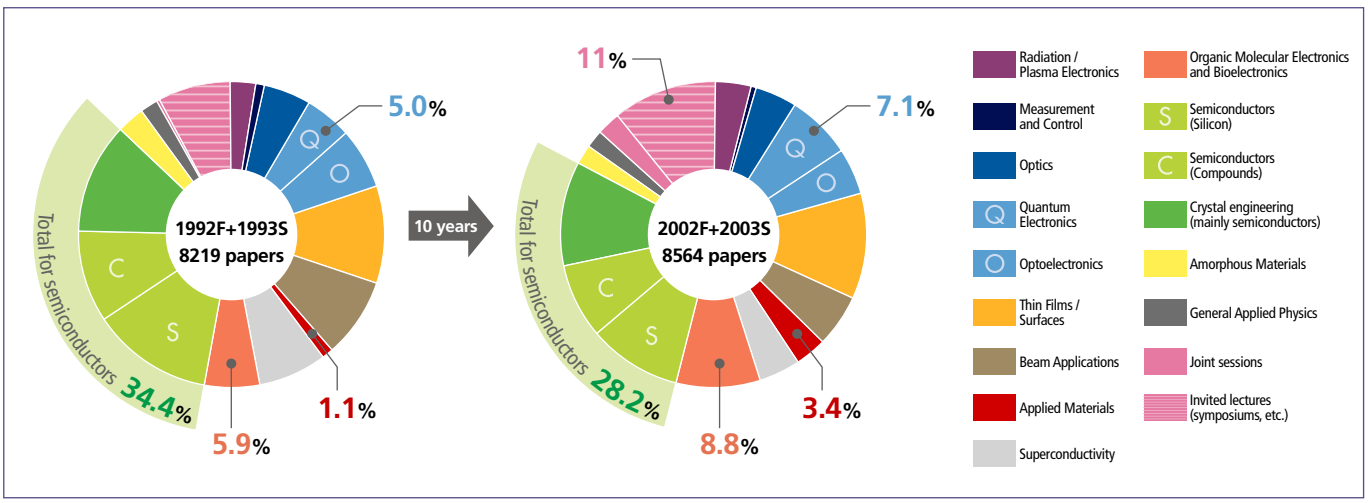

Fig. 2: Changes in the breakdown of the number of presentations in Main Classifications at JSAP Meetings over the past ten years. As in Fig. 1, analysis of the number of lectures for a single year refers to a given Fall Meeting and the Spring Meeting in the following year. Looking from a mid-term perspective, we can see growth in the fields of "Organic Molecular Electronics and Bioelectronics," "Quantum Electronics," and "Applied Materials," but a relative drop-off in semiconductor-related fields.

Table 1: Secondary Classifications demonstrating significant short-term increases (Classifications with 50 or more presentations at the 2003 Spring Meeting)

Main Classification	Secondary Classification	Average rate of increase over past 3 yrs.
Organic	Molecular Electronics (51)	44.5%
Organic	Organic Devices (71)	36.7%
Quantum Electronics	Photonic Nano-Structures and Relating Phenomena (82)	36.5%
Applied Materials	Thermoelectric Energy Conversion (53)	33.0%
Semiconductors (Si)	Gate Insulator Technology (133)	32.3%
Quantum Electronics	Ultrafast Lasers and High Field Lasers (53)	31.3%
Quantum Electronics	Laser Processing (71)	25.7%
Beam Applications	Lithography (70)	24.2%
Optics	Optical Instrumentation and Measurement (53)	20.6%
Optoelectronics	Optical Control (111)	17.5%

(Numbers in brackets indicate number of lectures at the 2003 Spring Meeting)