## Lectures

Monday, September 20,1982, through Thursday, September 23, 1982, Johannes-Kepler-University Linz

**COMMUNICATION TECHNOLOGIES NEW MEDIA IN EDUCATION, ECONOMY AND ADMINISTRATION**

Meeting of the Austrian Computer Society together with the Society for Education Technology

In recent years, developments of microelectronics have brought about a rapid change in society and economy, a change that has also had its effects on education.

Modern technologies such as: data transmission via satellites or glass fiber cables, public and private communication networks like display text, teletext, DATEX-P and inhouse networks, local application of microprocessors and mass storage as well as specifically media-oriented technologies like video disks and personal computers will be facets of our future communication scene.

Methods of training such as on-the-job training, public education through mass media, private studies, correspondence courses, and continued and adult education will be largely transformed by these new technologies. Interest in fundamental and introductory information of the state and trends of the new communication technologies will increase accordingly.

Lectures on these subjects are to indicate the possibilities and limits of these new communication technologies. The possible scope for future computer-aided education as well as possible dangers of the application of this technology without careful preparation are to be discussed at this meeting.

The meeting "COMMUNICATION TECHNOLOGIES" is addressed to: persons working with the media at large, top and medium level management in industry, commerce, banking and public administration, teachers and all persons engaged in education and training as well as representatives of all professional associations.

Monday, September 20, 1982
**Topic of the day: INTRODUCTION AND FUNDAMENTALS**
Chairman: Prof. Dr. R. Gunzenhduser, University of Stuttgart

Tuesday. September 21, 1982
**Topic of the day: TRENDS AND DEVELOPMENTS**
Chairman: Prof. Dr. M. Lánsky, University of Paderborn

5:30 p.m.: Panel discussion
**Topic: Effects of modern communication technologies on education**

Wednesday, September 22, 1982
**Topics of the day:**

**APPLICATION IN ECONOMY AND ADMINISTRATION**
Chairman: Dr. M. Paul, Technical University of Vienna

**OFFICE AUTOMATION**
Chairman: Dr. M. Paul, Technical University of Vienna

**COMMUNICATION NETWORKS AND DATABASES**
Chairman: Doz. Dr. R. Traunmüller

Thursday, September 23, 1982
**Topic of the day: EDUCATION**
Chairman: Prof. Dr. M. Lánsky, University of Paderborn

a) COMMUNICATION TECHNOLOGIES AND EDP IN SCHOOLS AND TRAINING

b) COMPUTER AIDED TEACHING AND STUDYING

c) MICROCOMPUTERS IN TEACHING

Registration and information: Österreichische Computer Gesellschaft
Wollzeile 1-3, 1010 Wien

Secretariate for the meeting: (from 9/20/1982):
Johannes-Kepler-Universität
Altenberger Straße 69, 4040 Linz
Tel.: (0732) 231381/601

Sunday, September 26, 1982, 5:00 p.m., Brucknerhaus, Small Hall
**Bernhard Horn**
**Application of Microprocessing and Digital Electronics in Electronic Music, Chances and Limits. (Or: How to Think Digitally)**

The goal of the lecture is to show the audience the variety of digital technology. CMI (Computer Musical Instrument) is an example for an application of computer, which can be done only by computer. Similar results can be achieved by universal "Personal Computers" with equivalent software. Other projects, especially electronic organs, can't be realized by general-purpose-computers, but need their own way of thinking. This should be expressed by presentation of a new all-digital organ. The following section contains a short consideration about effects, which arise only in digital filters. This type of filter will soon be needed for digital music production (digital equalizer, digital treble-bass-tuning).

Modern instruments are sometimes based on filterless synthesis of soundwaves according to the Fourier transformation. Since this procedure can't be performed by real-time, a new kind of synthesis was developed - CHESS (Complex Harmonic Equivalent Sound Synthesis), which corresponds to the abilities of microcomputers and so can be calculated by fast computing units today. A version without any multiplications leads to a very fast synthesis unit, which can be extended as you want. The simplest model already synthesizes within a cycle of 25 microseconds 25 natural or newly created sounds and variation in spectrum up to the 20th harmonic. It is possible to expand the system for simultaneous synthesis of an infinite number of sounds. So this principle is excellently qualified for computer controlled synthesizers and organs, and with regards to the advance in technology (faster processing units), it will be of commercial use in the foreseeable future.

Other interesting applications with microprocessors are polyphonic sequencers, which are introduced in organs as rythmic and accompaniment units, and which also control the tone and sound manipulation, e.g., generation of vibrato, envelopes, programming frequency-dividers and so on.

Friday, October 1, 1982, 4:00 to 8:00 p. m., Brucknerhaus, Small Hall
**Lectures**

**Guido A. Wemans**
**Energy from Outer Space–Global Significance of Solar Energy Satellites**

To start with an outline is given of the global energy situation and the main terms of energy technology are expounded so as to facilitate a better understanding of the whole subject matter. Using simple illustrations, the basic principle of producing electric energy in space and its transmission to earth is explained. Mention is made of various solutions proposed within the past 15 years but not yet realized- "Soletta" of the German-American space pioneer Krafft Ericke being a prominent example. This introductory paper concludes with an estimate of the future energy demand throughout the world and the significance of solar power satellites (SPS) for meeting this demand in the next century

Guido A. Wemans
Born in Zurich on January 30, 1938, eight years primary school, four years Zurich School of Commerce, worked in a bank, stayed in France for some time.
1960-1982 Joined IBM, training as a computer specialist, various responsibilities, finally organization consulting executive.
1964-65 Part-time studies at the University of Basel, four semesters of astronomy, two semesters of experimental physics.
Since 1964 member of the Astronomical Assosiation at Basel, regular public demonstrations at the University Observatory for eight years.
Since 1966 regular radio broadcasts (radio DRS) on astronomy.
Since 1968 regular contribution on the topics astronomy and space travel to the newspaper National Zeitung (now Basler Zeitung).
Since 1968 courses on astronomy and space travel at various colleges of adult education.
Since 1970 regular commentaries on all major space flights over radio DRS; various tours of main space centers. Since 1970 occasional appearances for Swiss Television primarily on the topic of computers.
Since 1970 various publications on the topics astronomy, space travel, and computer, participation in German editions of American books on space travel.
Since 1977 member of the Regional Coucil of Basel and vice-president of its energy commission.
Since 1979 provider of information for the pilot test ViDEOTEX of PTT (Post, Telephone and Telegraph Service), member of SVIPA (Swiss Videotex Information Provider Association).
Since 1982 editor of the magazine "vt" (journal for videotext).
By Oct. 1, 1982 owner of "Wernans Consulting", consulting on automation and communication.

**Dipl.-Ing. R. C. Meiner**

ESA - European Space Agency

**Art and Space Travel**
**Abstract**

Art as a prophesy of space travel on the one hand and the impact of space travel on art on the other is illustrated. Movements in the weightless state are shown as a new form of "ballet".

**Exposé**

1. Works of literature and paintings of the 19th and early 20th century are compared to corresponding later genuine space flights and photos as examples of prophetic works of art, e.g., Jules Verne, Chesley Bonestell, A. von Münchhausen, and others. The stimulus and inspiration science fiction had on space research is also demonstrated.

2. Examples are given of how space research has influenced various fields of art, as direct inspiration of contemporary works of art, improvement of artistic techniques through by-products of space technology and finally, the high degree of circulation and accessibility of works of art owing to modern satellite communication.

3. Selected series of movements, partly in the weightlessness of space, are presented as draft of a "ballet" in space.

Rudolf C. Meiner
Born in St. Gallen, Switzerland, on June 5, 1935. Schools in and around Zurich.
1958 Graduation from the Swiss Federal Institute of Technology, Zurich, in building engineering.
1961 Engineer's degree in astronautics at Stanford University, California. Since 1962 with the European Space Agency, ESA; head of the Test Program Department of the Spacelab. At the age of twelve (1947) first lecture on space travel, in 1977 official candidate of ESA for the first Spacelab.
Flight advocates industrialization of space for material and energy production. Wife from the Netherlands, two daughters.

**Dipl.-Ing. D. Kassing**

European Space Agency ESA/ESTEC (Netherlands)

**The Significance of the Solar Energy System in Space for Europe**

Solar Energy satellites are considered an alternative or complementary to nuclear fusion and breeder power plants for producing basic electricity in the next century. The concept of these satellites, known as SPS in short (Solar Power Satellites) makes use of the fact that the average density of solar energy in space close to earth is ten times more than on earth. A series of giant but very lightly built satellites, consisting mainly of solar collectors and radio equipment for energy transmission is to be installed 36,000 kilometers above the earth's surface. The transmitted electro-magnetical energy is picked up from the satellites by an adequate number of ground installations (rectennas) and transformed into usable basic electricity for the consumer.

Even though the project may seem gigantic at present (the collectors of each satellite were to measure 12 km in length and to be assembled in space), leading scientists in the USA and in Europe do not doubt the technical feasibility of the satellites. The operation of the energy

satellites is expected to cause relatively little strain on the environment. Estimates of costs for development and construction of the satellites, however, are still vague at present. An inexpensive test program might help to reduce uncertainty in cost estimates. At the space agencies NASA and ESA, the structures of such a test program have been discussed to determine how existing vagueness could be eliminated most economically.

The American Space Shuttle and the European manned spacelab could play an important part. Progressive space technologies, as in the field of energy supply, large structures, heat control, position control, radio microwave transmission–all of them developed for present and future projects–might likewise make their contributions.

The lecture will present and illustrate with some 30 slides the technical trends, opportunities, and limits of such an experimental and developmental program.

**Dieter Kassing**

1939 born in Kassel, Germany;
1960—1969 studies of applied physics, control engineering and aviation at the University of Technology in Darmstadt, systems technology at the University of Technology in Berlin;
1969 graduation as Diplom-Ingenieur of Physics;
1970—1972 work for the German-American space project "Solar Probe HELIOS";
1973—1977 scientific assistant at the Institute of Aviation and Space Aviation at the University of Technology, Berlin;
1977—1980 Research Fellow at the European Space Agency ESA; focusing on an analysis of the technological feasibility of the concept of so-called solar energy satellites;
Since 1980 member of ESA at the research centre ESTEC (Netherlands) working on an analysis of the feasibility of future space programs for energy production, technical initial planning for European space projects;
More than 25 scientific publications.