Ylem (Eye-lum): 1. The primordial stuff out of which the universe emerged. 2. An emerging group of artists who believe that science and art enhance each other and human understanding.
At long last Ylem is non-profit in the eyes of the Federal Government. In fact, donations made to Ylem since August 6th, 1984 are tax-deductible.

Some of you have a colored mark on your address label. In the last newsletter you received a colored envelope which we forgot to explain: it is for your membership renewal. This extra newsletter is your reminder notice. We hope you enjoy Ylem enough to renew another year, because memberships are almost our entire source of income, and your continued support is invaluable.

Through an arrangement with Leonardo Magazine, our members recently received a complimentary copy of this science and art magazine. A $30 membership in the International Society for the Arts, Sciences, and Technology for individuals includes a subscription to this quarterly journal. Also write them for instructions for submitting articles: The magazine may want to publish one about your work. In fact, a number of our members have been published in Leonardo over the years.

As we begin our fifth year, we have two major projects going: To document Ylem art and artists on film and video; and to work on projects related to SIGGRAPH '85. The video tape project will use slides, already existing video tapes, and eventually, new interviews of artists. It will generate more than one show, one of which may be shown at an event in San Francisco during SIGGRAPH. Please send slides to the Ylem address, and inform us of video tapes about yourselves.

A “Pop the Cork” potluck meeting will be held March 23rd, 4:30 to 9:30 pm at Josepha Haveman's. If you are interested in discussing the following, you’re invited: nomination of leaders for next year (before supper); and interactive and computer exhibit opportunities for SIGGRAPH (after supper). Trudy will bring champagne to celebrate our non-profit status and we will pop the cork at supper.

Other events to check on the Ylem Calendar: Stan Isaacs' polyhedral puzzle party, all afternoon on April 21st.

March 16, 10 am  How to Photograph Art. Bring one piece of either 2-D or 3-D art and learn how to photograph it. $5. Artists Equity members, $12, non-members. (Artists Equity membership brings many other benefits. See "Opportunities"). Artists' Gallery, CCAC, 5288 College Ave., Oakland.


March 23-24, 12-5pm Suisuki Exhibit, Japanese found sculpture using rocks that suggest landscapes. One cut in the rock is permitted to form a horizontal resting surface. Tradition requires very minimal presentation. Buddhist Temple, 2751 Louis Road, Palo Alto.

March 31, 1-4 PM Twin Pines Art Center Moving Sale. Art and art supplies. 1221 Ralston, (in Twin Pines Park), Belmont. Artists will be relocating their studios soon in a former school in Belmont.

April 13, 11 am Ylem Business Meeting, Upstairs at Trillium Union, Stanford University. Follow directions to Stanford on back page. Tressider U. is about 3 blocks behind Main Quad. Ascend the spiral stairs and enter. The chairs where we will be sitting are just inside.

April 13, 2-5:30 pm Ylem Forum, "Designing for Thinking," Jordan Hall 040, Stanford University. See directions on back page.

April 14-18 National Computer Graphics Association Conference, Dallas Convention Center, Dallas, TX. Like Siggraph, but more about practical applications. Registration hotline: 1-800-543-8000.

April 21, 1 pm Puzzle Party at Stan Isaacs'. Bring polyhedral puzzles, brain teasers, mathematics-related books and other oddities to share. Play with Stan's puzzles. 210 East Meadow, Palo Alto. Call 415/858-2568 for directions.

April 24, 7 pm How to Present Art for Commissions or Purchase. Informative panel discussion sponsored by Artists Equity and SFMOMA. Fourth Floor Board Room, San Francisco Museum of Modern Art.

April 28, 2 pm Ylem Field Trip Behind the Scenes at the Exploratorium. See how exhibits are created. Meet by water vortex inside main entrance. Small entrance fee to museum. 3601 Lyon St., San Francisco. Info: 415/856-9593.

April 28, 7 pm Ylem Party at Holos Gallery. Bring finger food, and any art or objects to share relating to 3-D technology. 1792 Haight St., San Francisco. Info: Gary Zellerbach, 415/668-6100.

Until April 30 Recent Computer Art by Luz Bueno, Elwood Gallery, 2999 College Ave., Berkeley.

Opportunities

April 19, 8:30 pm ACM SIGGRAPH '85 Film/Video Show. The Twelfth Annual Conference and Exhibition on Computer Graphics and Interactive Techniques: July 22-26, Moscone Center, San Francisco. Info: ACM Siggraph '85, 111 East Wacker Drive, A-2, Chicago, IL 60601; 312/644-6610.

The Astronaut's Gallery. A gallery in the Toronto area, dedicated to the art of flying. It will sell posters of pilots, astronauts and mythical characters, products involving anything that flies or is in the heavens. Please send description of your product or work to The Astronaut's Gallery, 7751 Yonge Street, P.O. Box 69, Thornhill, Ontario Canada L3T 3N1.

Beyond The Horizon. A gallery of artists whose works are generated by computer. Contact Elizabeth P. Van Doren, Director, Beyond The Horizon, 4608 Winthrop Street, Pittsburgh, PA 15213; 412/621-9777.

A National Museum of Computers and Telecommunication is proposed for the Los Angeles area by Shirley Lopez. She welcomes ideas from all interested people working in these fields, especially artists. Her address: 10442 Rexford Dr., Cypress, CA 90630.

A Master's degree program in interactive telecommunications, New York University's Tisch School of the Arts: Technology: Students are introduced to the principles governing basic telecommunications technology such as two-way cable, teleconferencing, microcomputers, videodisc, electronic text services, satellites, fiber optics, applications. Students learn how telecommunications technology can be used in business, government, education. Theory and Research: Emphasis on the principles of human and organizational communications theory and research, the design and evaluation of telecommunications systems. Info: Prof. Red Burns, Interactive Telecommunications Program, Tisch School of the Arts, NYU, 725 Broadway, 4th floor, New York, N.Y. 10003; 212/598-3338.


Program Ideas, publishable members' art sought on subject of "Life" for possible inclusion in Ylem July newsletter and August forum. Contact Ylem address: 415/856-9593.

Summer 1985 Workshops at Anderson Ranch. Emphasis on clay, wood, and photography. Info: Anderson Ranch Arts Center, P.O. Box 5598, Snowmass Village, CO 81615.

International Television Arts. A video/computer arts distribution network, accepts descriptions on potential video or computer art acquisitions. Specify format and send to Jim Weimer, Acquisitions, ITVA, 799 Broadway #212, NY, 10003.

Video Art Showcase, soon to be a feature on Manhattan Cable TV, seeks innovative video/computer art program material. Info: Gil Shaar, Programming, VAS, 451 Broome St., SW, NY, NY 10013.
Synopsis of "Making Data Real"  

Ylem Forum, February 1985, San Francisco  by Mark Burstein

First one takes *reality*, and from it extracts *data* ("that which we choose to measure"). Then one takes the *data* and tries to make it "real" again. In this process of representation, manipulation, simulation, and interpretation, much is revealed and, often incidentally, art is produced. Such was the theme of this meeting.

Trudy Reagan started us off with her circular aphorism "reality is not data/data is not knowledge/wisdom is not reality". Perhaps the true theme of the meeting is "Making Dada Real".

We watched a movie from Phoenix Data Systems titled "Insight". The sound track was unfortunately lost, but we could pretty well piece together the imagery, which consisted in the main of "slices" of the human body — skull, brain tissue, musculature, and spinal cord. The seemingly 3-dimensional chunks were computer-generated. The computer input consisted of stacks of flat cross-sections of the body from CAT scans (Computerized Axial Tomography, a kind of X-ray). These reconstructions are very useful in surgery, prosthesis, and medical analysis. Seen in this way, people look a lot like steaks.

The Japanese video artist Masahiko Kurasima sent us his piece "Revolution in the Distance", an antic collage of city noises, city scenes, space, and skeletal buildings produced on a video digitizer.

Michael Starks, who has been involved for many years with stereo (3-D) television, next shared with us some of his inventions and discoveries. The phenomenon of stereo vision (i.e. depth perception) is as old as man himself. He noted that during its development "a lot of monkeys fell out of a lot of trees". The *simulation* of it began around 1835 with the invention of the stereoscope (which *predated* photography).

The principle is simple — the *separation* of two distinct images (one for the right eye, one for the left) and their apparent *superimposition*. To produce these two images, seemingly 3" apart, many devices have been used: a camera with two lenses (or prisms); two cameras; carefully plotted line drawings; temporal parallax (e.g. taking two pictures out of an airplane window seconds apart); and, more recently, programming the laws of optics and viewpoint into a computer. Then to re-produce the two images while keeping them separate one can: physically separate the eyes (such as on a stereoscope or Viewmaster); make one image red and the other green ("anaglyphs"); use cross-polarized filters and glasses; in the case of television, send two alternating picture signals to be viewed through goggles with shutters; or even use multiple images in a lenticular screen (the "Lenticular Parallax Panoramgrams" of the 1930s and 40s and today's Nimlo cameras.

First, Michael demonstrated the illusion of depth with slides to the roomful of people wearing polarized-plastic glasses. Then we were able to come up and view his television setup two at a time with the glasses containing the shuttering device that turned the rapidly alternating images into optical magic. It was rather thrilling to watch 3-D TV, although there are clearly some tradeoffs still to be worked out — image quality, cost, convenience, and the inevitable eyestrain due to "accommodation conversion breakdown".

Unexpectedly, we were then treated to more slides (lucky we all still happened to have those silly glasses!) by Matt Rebholz of the National Stereoscopic Association. Being a stereo buff, he always has a packet of slides with him. Among the images I particularly remember from both their collections were: a protein molecule floating mysteriously above the screen; a computer graphic of a DNA spiral; oceanic topography; a cartoon of a castle being stormed;
Experiences in Visual Thinking

by Robert McKim (Brooks/Cole Pub., 1980)

This is an interactive book. My recollection of reading it seven years ago evokes the deserted interior of the 1950's luncheonette car of an AMTRAK train I was riding at the time. It was night. I was following these instructions in the book:

1. Look at a scene... see it as an overall pattern... follow outlines and count salient features. 2. Then close your eyes, 'let go', and conjure up the clearest possible image of what you have just seen. 3. Reopen the eyes, compare this image with reality, and repeat the process of analytical looking.

I remember being distressed at the inaccuracy of my mental image, but even more do I recall the solitude of the enameled pink lunch car, the empty tables and black windows and rolling train noises, the idle kitchen equipment — and the unexpected scurrying of a mouse across the aisle.

Later chapters demonstrated to me how internal image formation and drawing help each other, and together generate a prodigious number of ideas for solving design problems. McKim brings together notes on perception theory, strategies for designing and problem-solving, and ways to develop an awareness of one's aesthetic-kinesthetic skills as they work in concert with analytic thinking. Finally, he pushes the reader to use pencil and paper to give flesh to design solutions ricocheting in one's head.

I am fond of this book, and I suggest that the conscientious reader who does the sometimes wacky exercises will be too. By comparing my ease in doing them now with my difficulty years ago, I see that McKim's thesis is correct: one's power to visualize can be improved with conscious interest and practice.

— Trudy Myrrh Reagan

Opportunities cont. Resources cont.

Challenge: Can an optical illusion of a seemingly 3-dimensional object be drawn that flips from a right-handed twist to a left-handed one, and vice versa? This would illustrate such transformations as one might predict in a quantum psychology. Discuss problem and share solutions with author Eddie Oshins, 850 Coleman, Apt. 3-A, Menlo Park, CA 94025; 415/321-9271.

The Independents. A national showcase of film/video works by independents is being offered on 2 NY cable outlets. Info: The Learning Channel, 1200 New Hampshire Ave. NW, #240, Washington, DC 20036; 202/331-8100.

Artists Equity offers many benefits to the professional artist: group life and health insurance, insurance for artwork, information on legal matters and occupational hazards, as well as national lobbying for art legislation, and events like those described on the Calendar. Info: Artists Equity, P O Box 28068, Central Station, Washington, DC 20038; 202/638-9633.

Resource List

The Association for Computer Art & Design Education, ACA + DE's purpose is to help individuals and institutions interested in integrating the computer into fine art and graphic design curricula. Members receive the following benefits: Annual Showcase/Exhibit, CompuServe Full Membership $35. Info: Clay Gordon, Executive Director, ACA + DE, P.O. Box 408, South Plainfield, New Jersey, 07080; 201/756-9278.

The Wired Librarian's Newsletter is zany, humorous, a bit cynical and packed with facts and tips about microcomputer and software for librarians. It is irreverent, but at the same time imminently useful in decoding the somewhat confusing world of high technology. $15 per year from The Wired Librarian's Newsletter, c/o Microcomputer Libraries, 145 Marcia Dr., Freeport, IL 60010; 815/235-2955.

Mindset Video Production System. A videographics system which allows for the overlay and integration of Mindset generated graphics to any standard video source. A productive way to expand your Mindset computer. $3799. Info: 408/737-8555.

Bay Area SIGGRAPH. Its intent is to promote local interest and professional support for computer graphics by means of technical and artistic meetings, lectures, shows, and presentations. Dues, $10.00 per calendar year. Brian Cabral, Bay Area SIGGRAPH Treasurer, P.O. Box 3553, Santa Clara, California 95055.

Mathematics and Optimal Form, Stefan Hildebrandt and Anthony Troma (Scientific American Library, 1985, $25). Beautiful illustrations of such forms as bubbles and crystals, and readable text. Much here for the person who can’t “read mathematics”.


"19 to Learn By", Psychology Today, Sept. '84. An evaluation of new computer programs "that really do help children".

Synergetics Study Group. People interested in the mathematical aspects of Buckminster Fuller’s work are having get-togethers. Info: Jeremy Sherman, 190 Yolo Ave., Berkeley, CA 94707; 415/526-8669.

"The Shape of Things" and "Mathematical Mystery Tour". Two vivid NOVA programs about the implications of mathematics. Transcripts: Send $4 to P.O. Box 322, Boston, MA 02134, and mention name of program. Available on film in 1985 from Time-Life Video, 100 Eisenhower Dr., P.O. Box 644, Paramus, NJ 07653; 201/843-4545.

Coronary Angiography, Dr. J. Silverman (Addison-Wesley, 1985). A very specialized book for surgeons. However, it is worth noting because it comes with a plastic model of the heart that “permits the student to visualize vessel motion in three dimensions instead of the two-dimensional mode... on a movie.” It is not only the tools of new scanners and computer simulations that are changing the teaching of such subjects, but also teachers’ awareness of the nature of visualization.

The Visual Display of Quantitative Information, Edward Tufte (Graphics Press, Cheshire, CT, $30, hardcover). The author is a political scientist as well as graphic designer. This beautifully presented book offers historical examples of graphs, (including one on ruinous government deficits dated 17861); graphs fascinating in their variety and ingenuity; and sensible guidelines for the clear and truthful presentation of statistics.

Lightworks Magazine. Illuminating new art and the near history of its innovators. 4 issues, $10. Lightworks Magazine, P.O. Box 1202, Birmingham, Michigan 48001-2202 U.S.A.


SCAN. The latest developments in graphics and music for small computers. SCAN is published by the Small Computers in the Arts Network. $12 for 10 issues. SCAN, Box 1954 Philadelphia, PA 19105.

Applied Concepts in Microcomputer Graphics, by Bruce Artwick. Description of equipment that would be good to read before investing in some. Design elements, and mathematical transforms discussed as well as animation and presentation graphics. $30, 15-day trial offer. Prentice-Hall, Inc., Rt. 59 at Brook Hill Dr., W. Nyack, N.Y. 10959.

Design Methods, Seeds of Human Futures, by J. Christopher Jones (Wiley-Interscience, 1970). This book is the first attempt at understanding and describing the new design methods that have appeared in response to a world-wide dissatisfaction with traditional procedures.


One of the key problems in artificial intelligence and fifth generation computers is this: what does knowledge look like? If we have gigabytes in our workstations, we have access to so much that we have access to nothing. Part of the solution in making increasingly complex systems of knowledge and tools comprehensible to human beings is designing the appearance of facts, concepts, and emotions, as well as the tools for managing and interacting with this knowledge.

It is an exciting and challenging time for the visible language programmer (information-oriented, systems-oriented graphic designer) who can and must assist computer language programmers in visualizing structure and process. Their task is to create the Three Faces of computers: Outer-faces, Inter-faces, and Inner-faces.

Outer-faces are hardcopy or softcopy displays of information. Inter-faces represent the command/control and documentation dialogue between the human being and the machine. Inner-faces show the code and operating systems of the machine itself.

Aaron Marcus and Associates is a team of professionals that helps to create the visual metaphors and information narratives that will inform, listen to, and instruct us as we make our way through worktime and playtime. Cinematically speaking, we are now in the era of the silent movies. What we see on our computer screens now is just the beginning of the animated, colorful, noisy faces of the future that will greet us and guide us.

Aaron Marcus 1985
Above it is a diagram of a virus. This species, barely visible in a scanning electron microscope, appears as a blurry icosahedron. Molecular biologists anxious to understand it in more detail have drawn this conjecture of its structure. Here, matter aggregates itself into a living creature.

Where life exists, there is the possibility of thought, represented here by a puzzle by Stu Coffin. Puzzle makers have a mental model not only of how polyhedral shapes can be made to fit, but also of typical thinking responses. They play with thwarting the expectations of those who will try to solve their constructions.

Where there is thought, the possibility of conjectures about space exist.

As I worked on this hanging, the circular arrangement of its modules suggested itself. It led me to read about atoms and brains, levels of existence and "strange loops". It became a conjecture, a tool for thinking in its own right.

**A MEMORIAL**

"If in the course of some wandering I come onto something delightful or exhilarating or beautiful or insightful, I want to tell someone else about what I have found. More than that, I want to bring them along with me to share what I have discovered: a view, a feeling, a person or a book or a new way of looking at physics or at justice, or a new way of teaching relativity."

Frank Oppenheimer
August 14, 1912—February 3, 1985
Founder and Director
of the Exploratorium

have to know where Snowflake Court is relative to your present location. Although the address might be complete, it is only valuable to you if you are familiar with the city. The second response describes the procedure by which you would get to the house, given your present position and orientation. It is a purely 'local' description in that it makes no assumption that you know any of the streets in the community. It assumes only that you can follow simple instructions that make incremental changes in your present position. If you were in a strange city, you probably would find the second answer much more useful than the first. Each instruction is given with respect to the position and orientation of the participant at the end of the previous instruction. This descriptive procedure is identical to that used in turtle graphics.

"Just as descriptive procedures make sense, the exceptional power of turtle graphics makes it most valuable for illustrating important properties of geometric figures (for example, curvature). Its similarity to natural descriptive language has made turtle graphics a most powerful vehicle in allowing people to discover important geometric principle on their own."

21st in Palo Alto; and a double-header on April 28th, a behind-the-scenes look at the Exploratorium at 3 p.m., and a party at 7 p.m. at the Holos Gallery in San Francisco. People attending both will probably contrive to eat supper somewhere together.

Many, many thanks to Lilli Quirke and Fred Stitt who put on outstanding events for us in February and March.

An Ylem newsletter for July, and a forum at Stanford on August 3rd on the subject of "Life" is being planned. We are looking for publishable art and program ideas. Also, anyone who knows artists working in this vein, be they photographers, biological illustrators or painters, please tell them that they will be welcomed as members. We need them! The biggest news in science in the last 15 years has been in the Life Sciences: molecular biology, ecology, brain research, and genetics, and the interests of more of our members should reflect this.

Some of the people who are too far away to join in these activities have expressed a feeling of isolation. Any of you are welcome to consider organizing your own events. Write the Ylem address for a list of ideas that are free or very cheap to do, and start your own chapter. This can be a very low-key and informal, for the sharing of ideas. Ylem was formed in the same way because Trudy Myrrh Reagan was intellectually lonesome and forlorn.

**YLEM IS A NON-PROFIT ORGANIZATION**

**Ylem Membership Application**
Send to Ylem, 987 Moreno, Palo Alto, CA 94303

NAME
ADDRESS
CITY
PHONE
□ to receive a sample issue
□ $15 individual membership (1 year)
□ $100 minimum corporate/institutional membership (1 year)
□ $10 newsletter only. If you live more than 100 miles from San Francisco or Palo Alto.

HEALY DESIGN
1044 HOWARD STREET
SAN FRANCISCO, CA 94103
415/ 864-7033

March 1985 Ylem 7
Next Forum

"Designing for Thinking"

April 13, 2-5:30 pm, Jordan Hall, 040, Stanford University

Mechanical Universe, a video by Jim Blinn
Idea Forms, Scott Kim
The Lorenz system, math film by Bruce Stewart
Play-Tasting, De Koven
Motivation, and 'Flow'
Dream House, a video by Sally Pryor

presented in co-operation with the Stanford Computer Arts Society
Free—bring friends and art to share!

Bring these directions with you! From Hwy. 101 or El Camino, enter campus from University Ave. (Palm Dr.). Park around the oval in front of main Quad. Go to Old buildings on the front of main Quadrangle. (This is not the same as "Jordan Quad"!) "Jordan Hall is carved into the building overhead. Our meeting room is in the basement.
(11:00 a.m. business meeting is at Tressider Union. Details on Calendar)