University of Rochester

Laboratory for Laser Energetics

UR LLE

OMEGA EP Building Site

Overview of OMEGA EP building: during construction (right); groundbreaking ceremony (middle right); architect's drawing of building (middle); and aerial shot of site (bottom). A drawing of the overall site plan forms the background.

2004 January

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		DECEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	FEBRUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	1 New Year's Day University Holiday	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

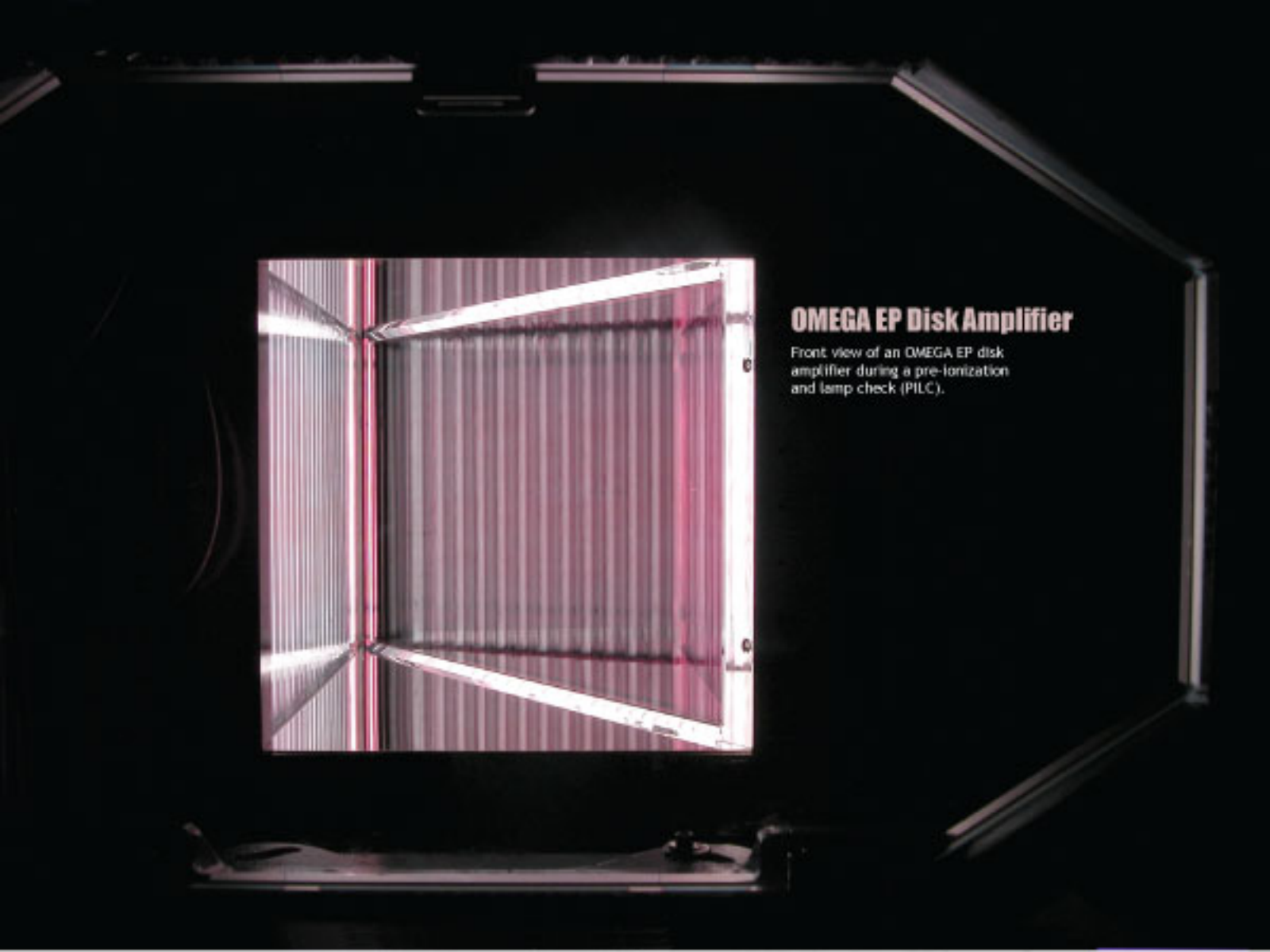
History

29 YEARS AGO

31 January 1975

The Special Atomic Energy Commission Laser-Fusion Advisory Panel issued its final report. The panel found that laser fusion was a promising approach to power generation that also offered a wide range of other applications and deserved broader support, including participation by industry, universities, and utilities.

Notes:



OMEGA EP Disk Amplifier

Front view of an OMEGA EP disk amplifier during a pre-ionization and lamp check (PILC).

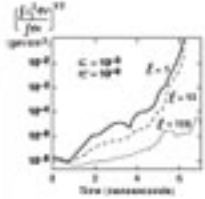
2004 February

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6 LLE Seasons' Party	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	JANUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	MARCH S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31				

History

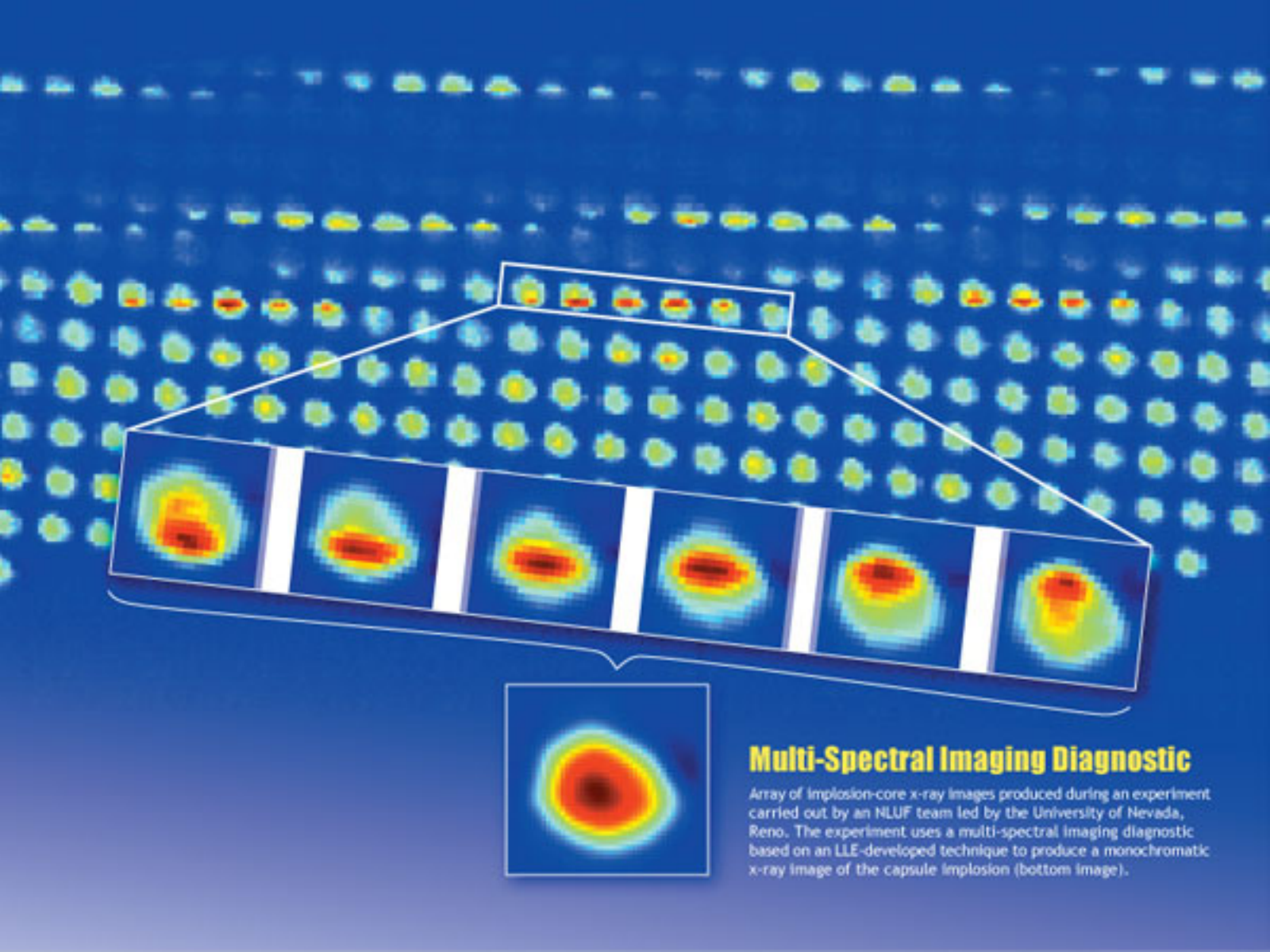
30 YEARS AGO



18 February 1974

"Linear Stability Analysis of Laser-Driven Spherical Implosions," published in Physical Review Letters by J. N. Shiau, E. B. Goldman, and C. I. Weng of LLE, is one of the first studies on hydrodynamic instabilities in laser-driven fusion.

Notes:



Multi-Spectral Imaging Diagnostic

Array of implosion-core x-ray images produced during an experiment carried out by an NLUF team led by the University of Nevada, Reno. The experiment uses a multi-spectral imaging diagnostic based on an LLE-developed technique to produce a monochromatic x-ray image of the capsule implosion (bottom image).

2004 March

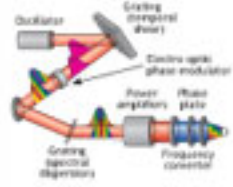
UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
FEBRUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20 Vernal Equinox
21	22	23	24	25	26	27
28	29	30	31	APRIL S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30		

History

15 YEARS AGO

SSD Concept (1-D)



24 March 1989

"Improved Laser-Beam Uniformity Using the Angular Dispersion of Frequency-Modulated Light," by S. Skupsky *et al.*, of LLE, is submitted to the Journal of Applied Physics. It details the basis of the SSD beam-smoothing technique now used on all Nd:glass fusion lasers.

Notes:

Laser–Plasma Interaction

Photograph from an OMEGA laser-plasma interaction (LPI) experiment. The red light is the half-harmonic of the incident UV light and is produced by the two-plasmon-decay (TPD) instability.

2004 April

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			MARCH S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1	2	3
4 Daylight Saving Time Begins	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	MAY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

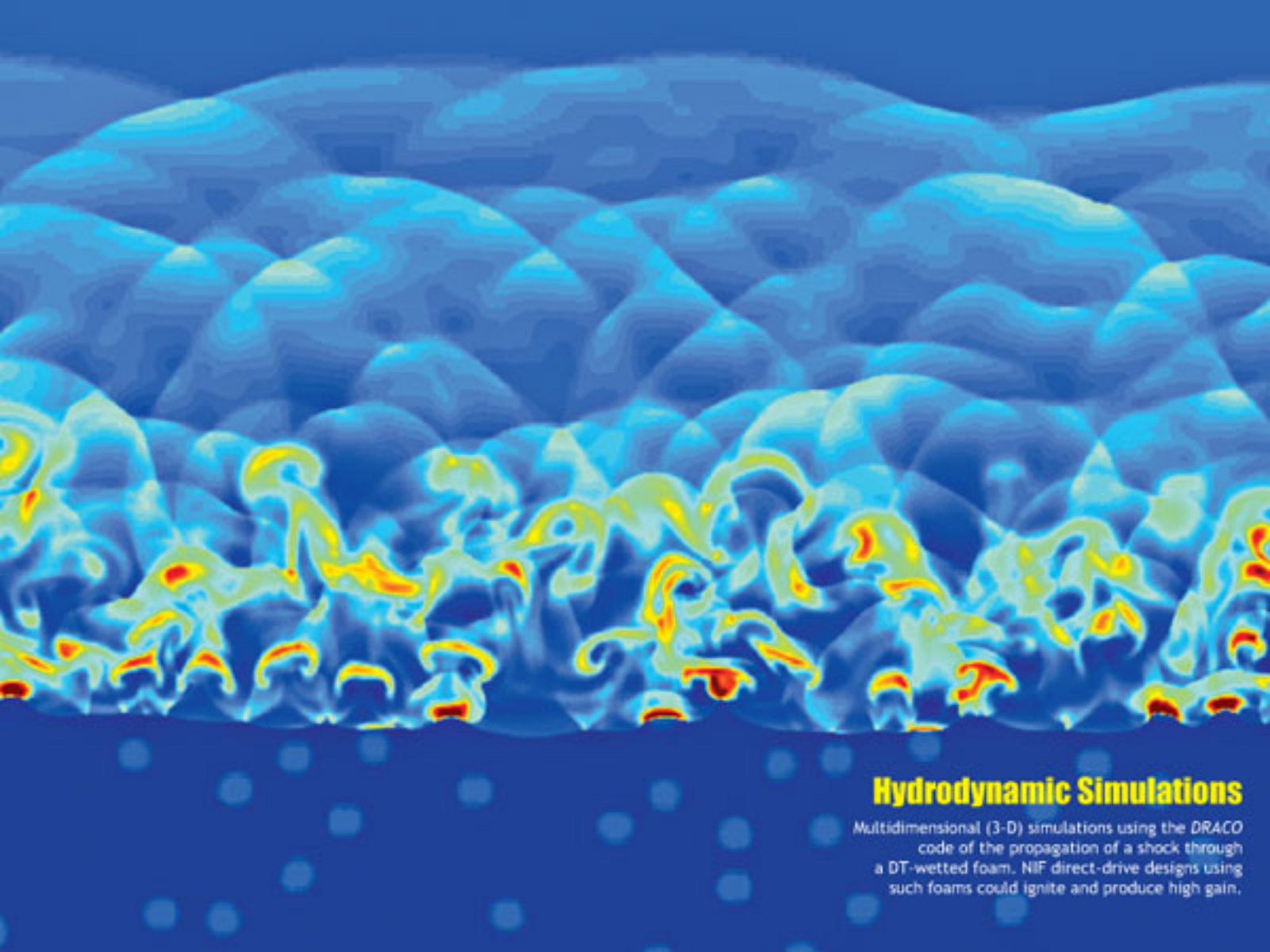
History

28 YEARS AGO

2 April 1976

A ceremony is held to lay the cornerstone for the LLE building. Guests included representatives of the university, government, and industry.

Notes:



Hydrodynamic Simulations

Multidimensional (3-D) simulations using the *DRACO* code of the propagation of a shock through a DT-wetted foam. NIF direct-drive designs using such foams could ignite and produce high gain.

2004 May

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				APRIL S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	JUNE S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1
2 34th Anomalous Absorption Conference Gleneden Beach, OR	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31 Memorial Day University Holiday					

History

32 YEARS AGO

17 May 1972

The Laser Fusion Feasibility Project (LFFP) is established at LLE. It is the first privately funded effort involving industry-university-government collaboration to investigate laser fusion as an energy source for the future.

Notes:

Tiled Gratings

Two-grating assembly used to demonstrate the ability to use tiled gratings to generate ultra-high-power laser pulses on OMEGA EP.

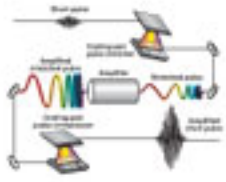
2004 June

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
MAY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23/30 24/31 25 26 27 28 29	JULY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1	2	3	4	5
6	7	8	9	10	11 LLE Picnic Mechanical and Electronics Engineering	12
13	14	15	16	17	18 LLE Golf Tournament at Deerfield	19
20 Summer Solstice	21	22	23	24	25 LLE Picnic Experimental Operations and Laser Engineering	26
27	28	29	30			

History

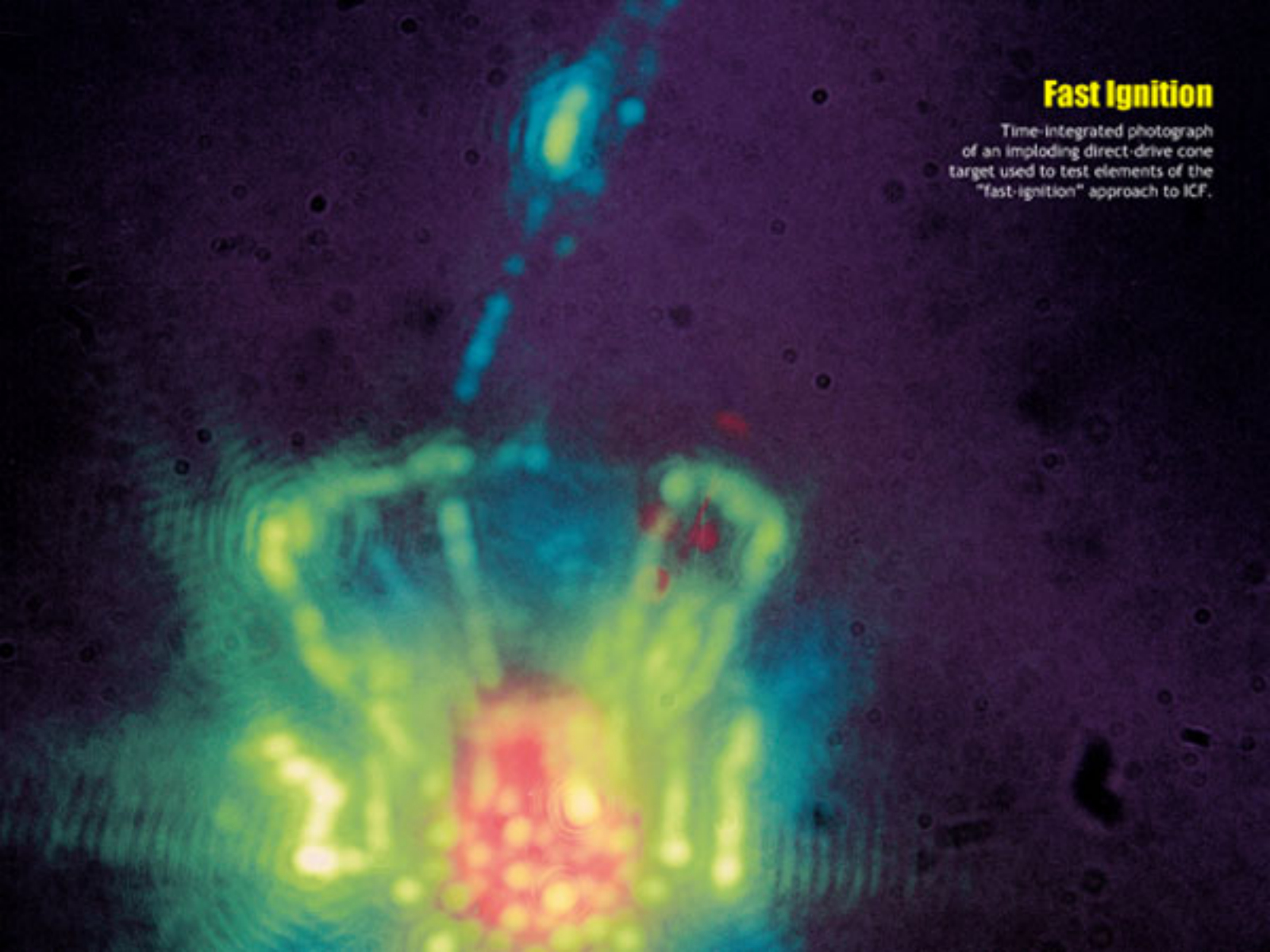
18 YEARS AGO



JUNE 1986

An article published in Laser Focus by Mourou, Strickland, and Williamson of LLE describes how chirped-pulse compression can be applied to high-energy laser amplifiers (CPA). This technique, developed and demonstrated at LLE in 1985, is the basis of modern petawatt lasers.

Notes:



Fast Ignition

Time-integrated photograph of an imploding direct-drive cone target used to test elements of the "fast-ignition" approach to ICF.

2004 July

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		JUNE S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	AUGUST S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	1	2	3
4 Independence Day	5 University Holiday	6	7	8	9 LLE Picnic COM	10
11	12	13	14	15	16 LLE Picnic Director's Office and Theory Division	17
18	19	20	21	22	23 LLE Golf Tournament at CenterPointe	24
25	26	27	28	29	30 LLE Picnic Administrative Division	31

History

6 YEARS AGO

OMEGA shot 7221

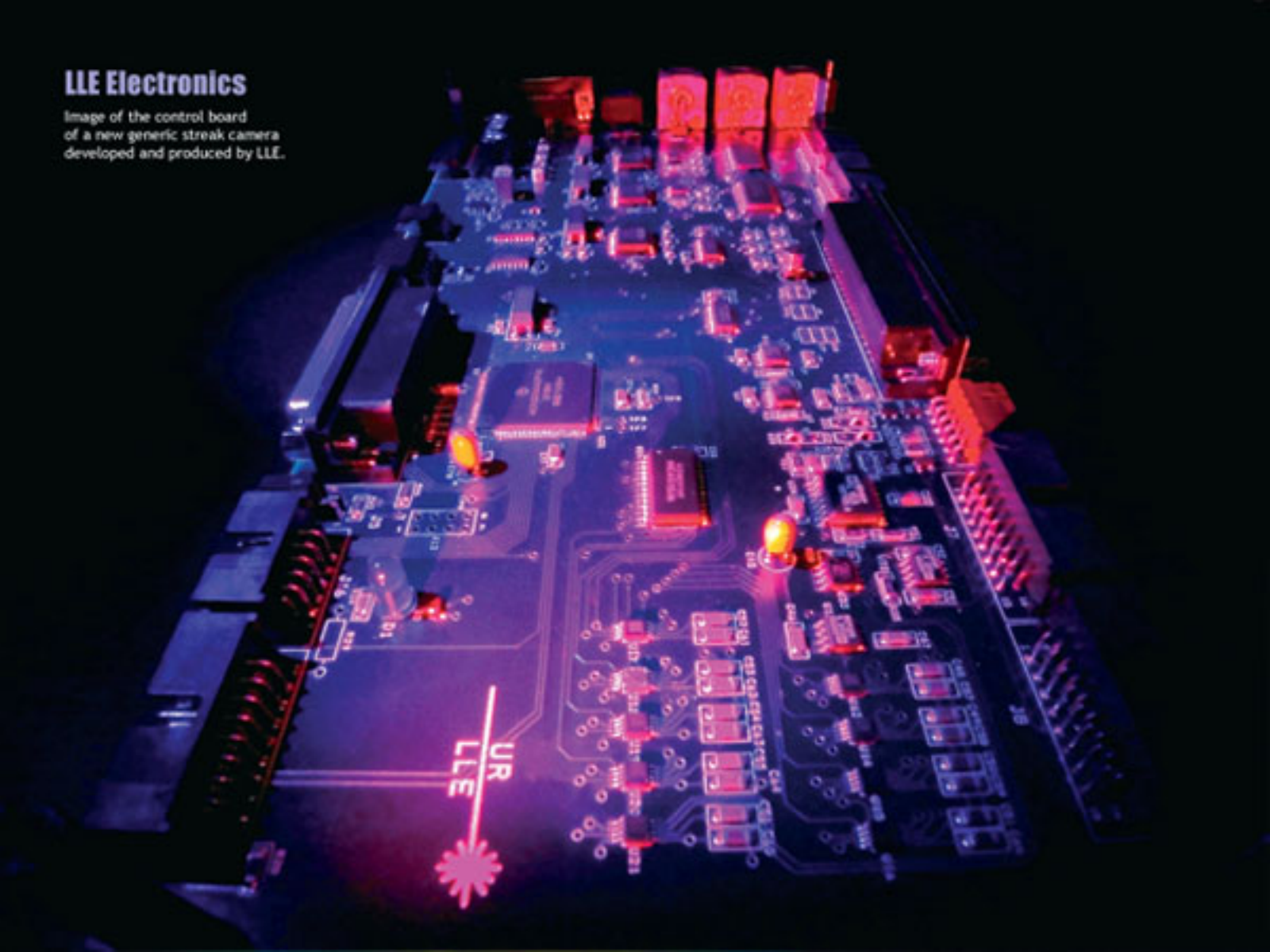
6 July 1998

The first experiments using a NIF-like multiple beam phasing configuration on hohlraum targets were conducted on OMEGA in 1997 and reported in an article by scientists from LANL, LLNL, and LLE published on this date in Physical Review Letters.

Notes:

LLE Electronics

Image of the control board of a new generic streak camera developed and produced by LLE.



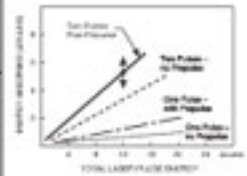
2004 August

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6 LLE Picnic Materials/Optical Technology	7
8	9	10	11	12	13 LLE Picnic Experimental Division	14
15	16	17	18	19	20 LLE Golf Tournament at Bristol Harbour	21
22	23	24	25	26	27 LLE Picnic OMEGA EP	28
29	30	31	JULY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	SEPTEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30		

History

33 YEARS AGO



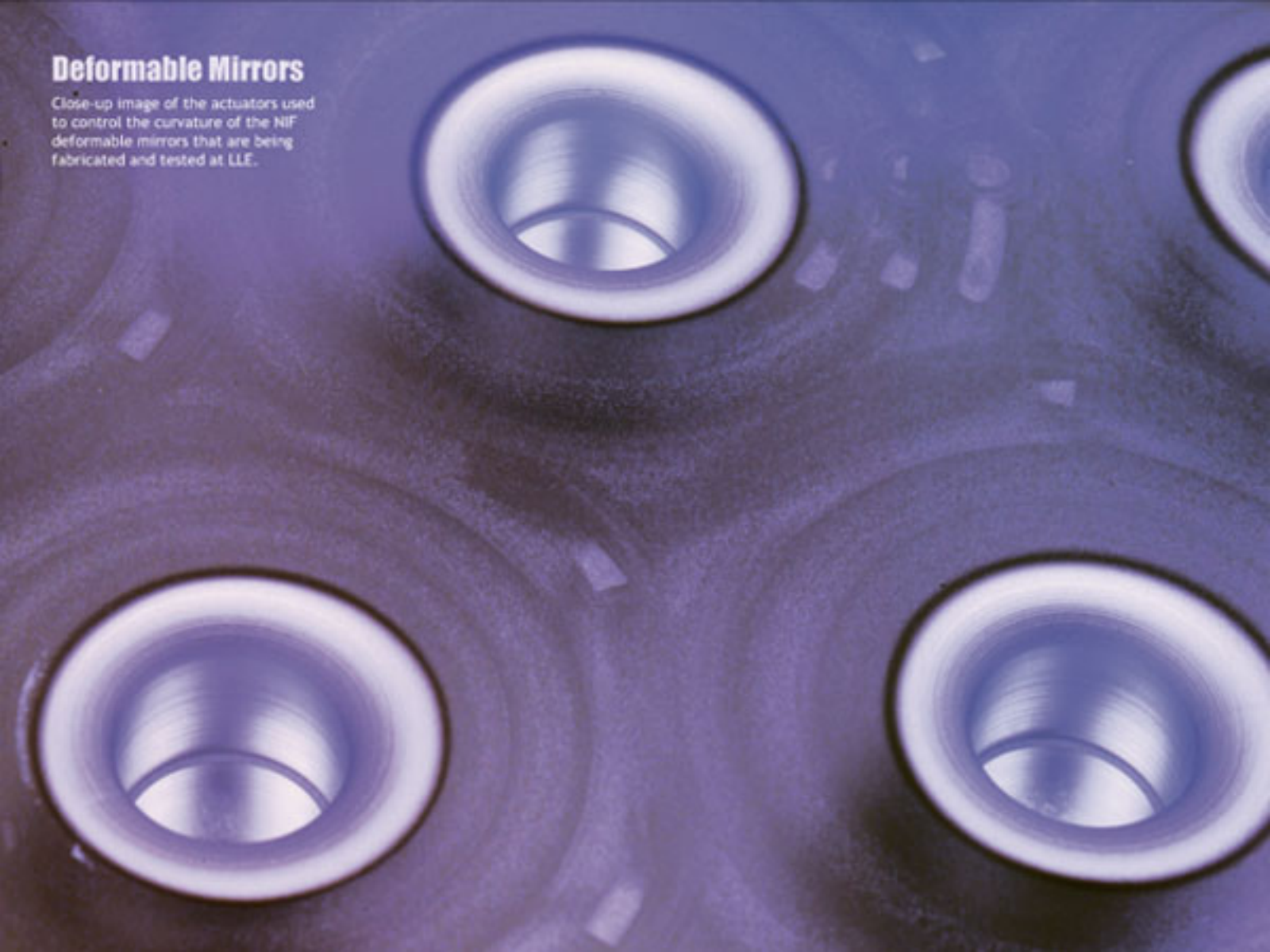
30 August 1971

At a laser-matter interaction workshop held at RPI, LLE scientists present the first results on the use of multiple short laser pulses to enhance absorption of laser light by laser-fusion targets. Multiple-laser-pulse irradiation (pickets) is a feature of current high-gain, direct-drive target designs.

Notes:

Deformable Mirrors

Close-up image of the actuators used to control the curvature of the NIF deformable mirrors that are being fabricated and tested at LLE.



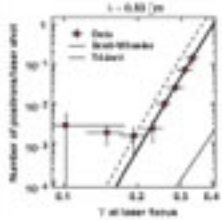
2004 September

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4
5	6 Labor Day University Holiday	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22 Autumnal Equinox	23	24	25
26	27	28	29	30	AUGUST S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	OCTOBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24/31 25 26 27 28 29 30

History

7 YEARS AGO



1 September 1997

"Positron Production in Multiphoton Light-by-Light Scattering" is published in Physical Review Letters. The work is the result of a multi-institutional collaboration that made use of an LLE-developed laser source on SLAC to provide the first laboratory evidence for inelastic light-by-light scattering involving only real photons.

Notes:

NLUF Experiments

Starburst created by visible light produced during an OMEGA experiment carried out by an NLUF team led by Polymath Research Inc. The goal of the experiment is to use optical-mixing techniques to control the stimulated Raman backscattering instability by crossing a blue beam with a green beam.

2004 October

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			SEPTEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	NOVEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31 Daylight-Saving Time Ends						

History

34 YEARS AGO

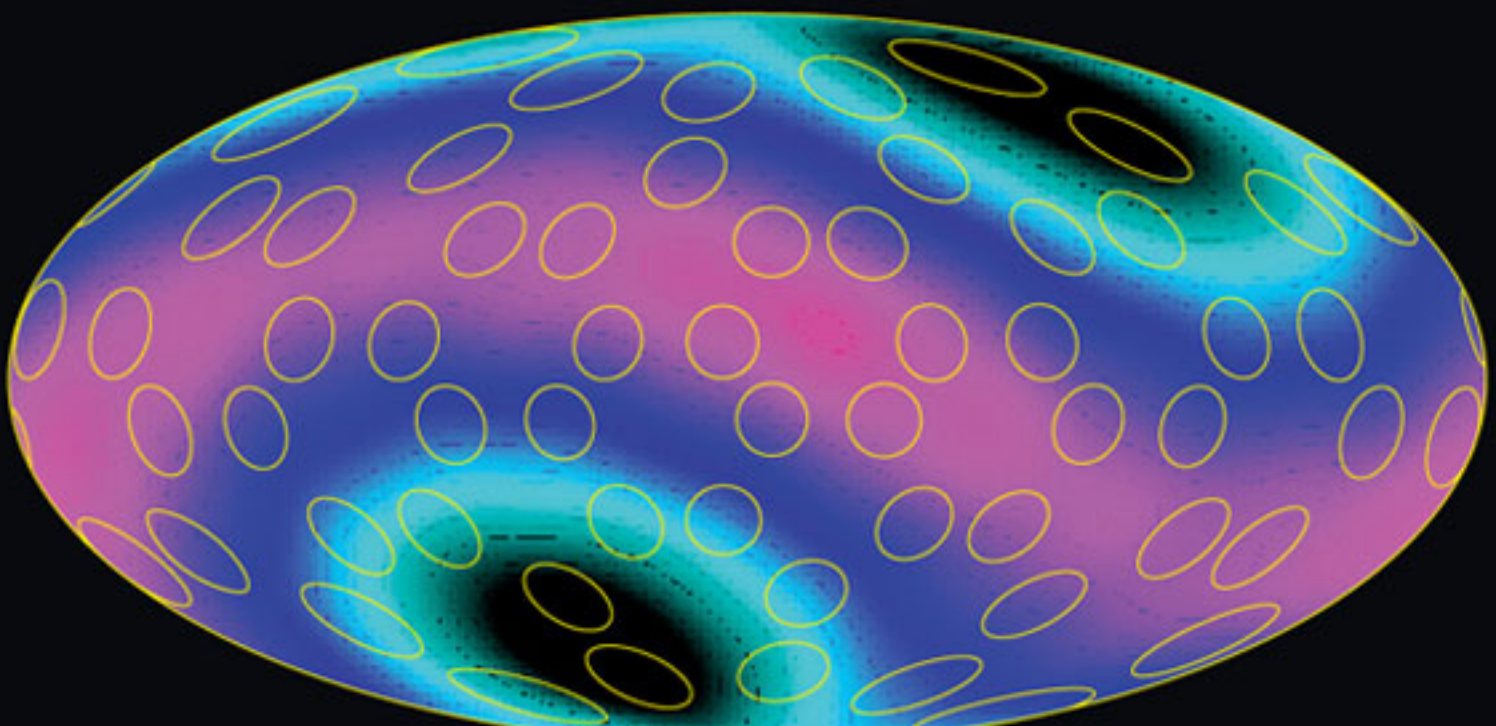
October 1970

The University of Rochester establishes the Laboratory for Laser Energetics with a mission to investigate the interaction of intense radiation with matter. LLE's founding director was Moshe Lubin.

Notes:

Asymmetrically Irradiated Direct-Drive Targets

Color map of the energy distribution produced on a spherical target during an OMEGA experiment to study asymmetrically irradiated direct-drive targets.



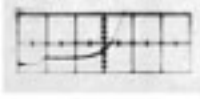
2004 November

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
OCTOBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15 APS Conference Savannah, GA	16	17	18	19	20
21	22	23	24	25 Thanksgiving University Holiday	26 University Holiday	27
28	29	30	DECEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31			

History

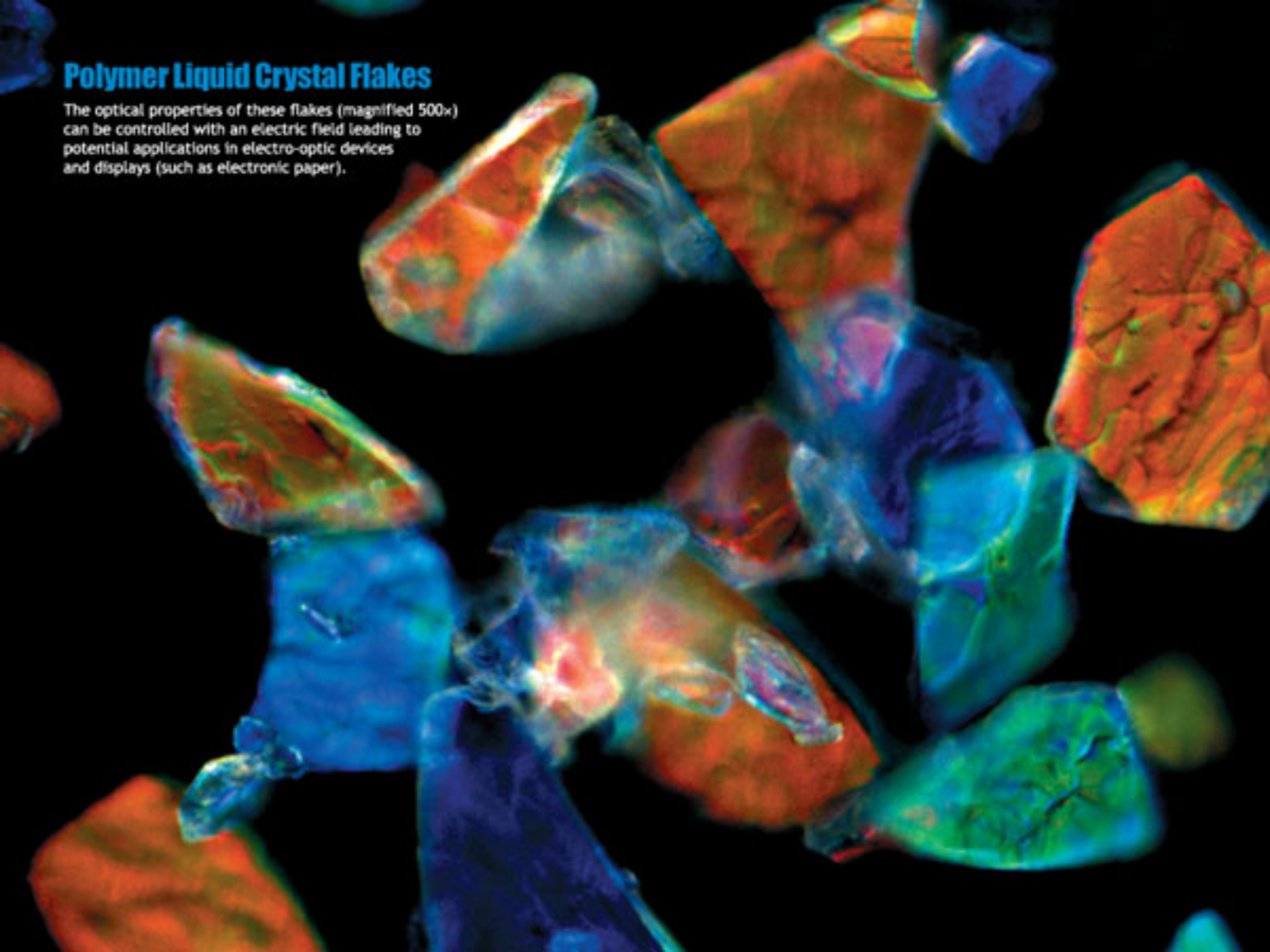
37 YEARS AGO



November 1967

Initial laser-matter interaction experiments begin at the University of Rochester in a laboratory within the Department of Mechanical and Aerospace Sciences.

Notes:

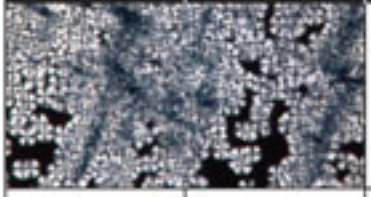


Polymer Liquid Crystal Flakes

The optical properties of these flakes (magnified 500×) can be controlled with an electric field leading to potential applications in electro-optic devices and displays (such as electronic paper).

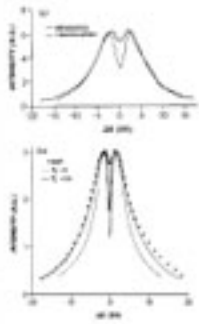
2004 December

UR LLE

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		NOVEMBER S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21 Winter Solstice	22	23	24 University Holiday	25 Christmas
26	27	28	29	30	31 University Holiday	JANUARY S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

History

27 YEARS AGO



12 December 1977

The first direct measurement of compressed fuel density in a laser-imploded target using x-ray spectroscopy is reported in a Physical Review Letters article by LLE scientist B. Yaakobi *et al.*

Notes:

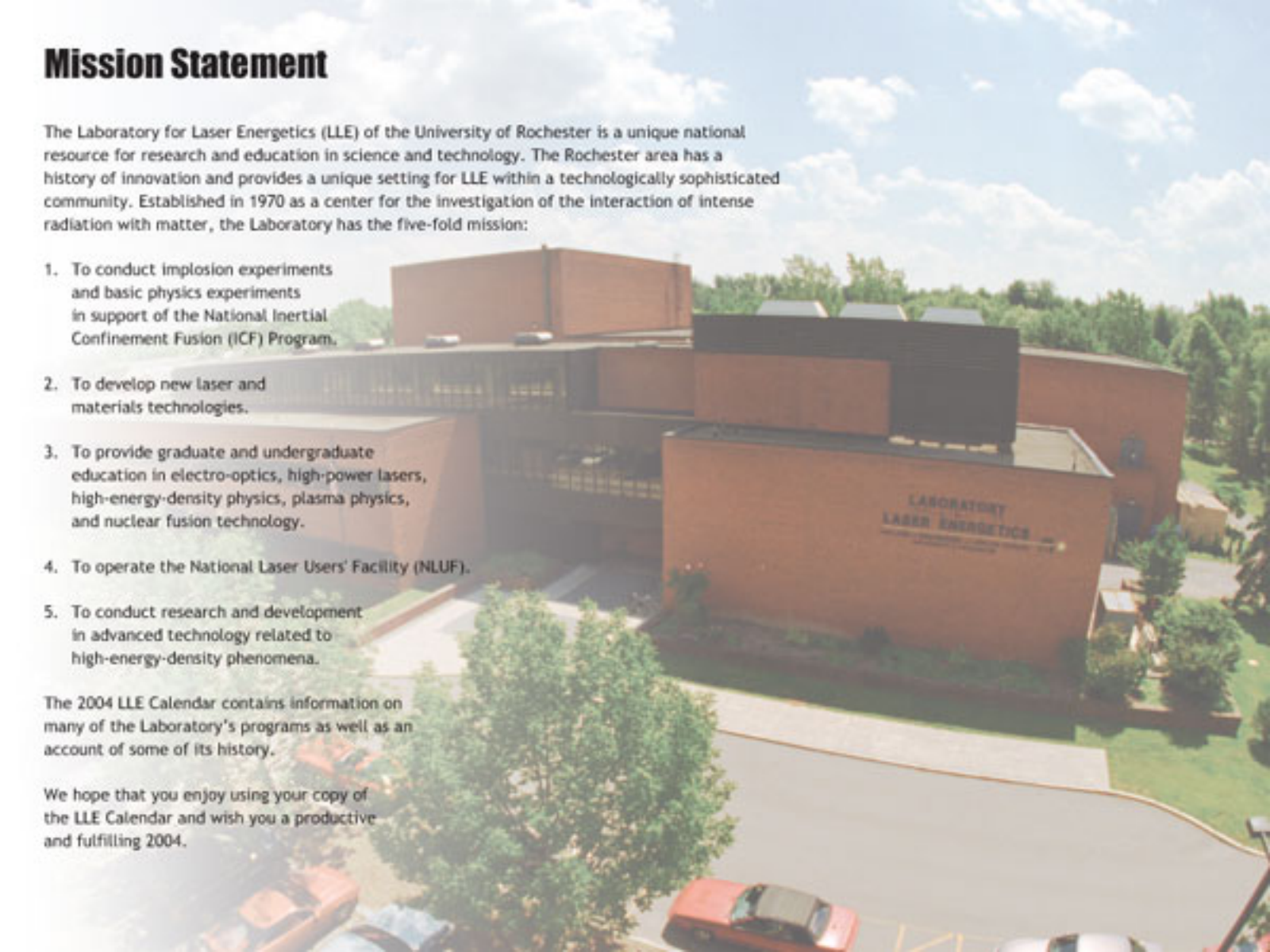
Mission Statement

The Laboratory for Laser Energetics (LLE) of the University of Rochester is a unique national resource for research and education in science and technology. The Rochester area has a history of innovation and provides a unique setting for LLE within a technologically sophisticated community. Established in 1970 as a center for the investigation of the interaction of intense radiation with matter, the Laboratory has the five-fold mission:

1. To conduct implosion experiments and basic physics experiments in support of the National Inertial Confinement Fusion (ICF) Program.
2. To develop new laser and materials technologies.
3. To provide graduate and undergraduate education in electro-optics, high-power lasers, high-energy-density physics, plasma physics, and nuclear fusion technology.
4. To operate the National Laser Users' Facility (NLUF).
5. To conduct research and development in advanced technology related to high-energy-density phenomena.

The 2004 LLE Calendar contains information on many of the Laboratory's programs as well as an account of some of its history.

We hope that you enjoy using your copy of the LLE Calendar and wish you a productive and fulfilling 2004.



2004

JANUARY

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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

FEBRUARY

S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29						

MARCH

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL

S	M	T	W	T	F	S
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25	26	27	28	29	30	

MAY

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JUNE

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27	28	29	30			

JULY

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
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OCTOBER

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					1	2
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17	18	19	20	21	22	23
24	25	26	27	28	29	30

NOVEMBER

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21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
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19	20	21	22	23	24	25
26	27	28	29	30	31	

2005

JANUARY

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23	24	25	26	27	28	29

FEBRUARY

S	M	T	W	T	F	S
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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

MARCH

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6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

APRIL

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

MAY

S	M	T	W	T	F	S
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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

JULY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

AUGUST

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

SEPTEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

OCTOBER

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

NOVEMBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

DECEMBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

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