

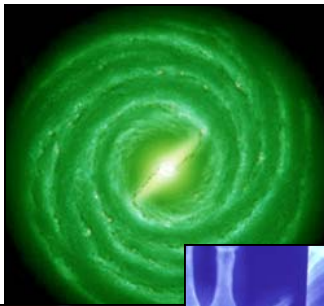
OPTICAL SCIENCES AND TECHNOLOGY PROGRAM

September 1, 2009

The University of Arizona College of Optical Sciences is home to the TRIF Optical Sciences and Technology Program. The program is multidisciplinary, with the College of Optical Sciences forming the core of the initiative. Through joint faculty appointments, cooperative research initiatives, and multidisciplinary outreach events, the optics college partners with the College of Science, the College of Engineering, and the College of Medicine to develop new technologies that will power the future of nearly every field of science and technology.

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The impact of optics on the economy of the State of Arizona and the country as a whole in the coming years is staggering. The market for optics in communication, medical care, heavy industry, sensing and security, and military exceeds \$200 billion per year.



The mission of the TRIF Optical Sciences and Technology Program is to further enhance the University's international preeminent optics program through the development of novel initiatives in optics education, research, workforce development, and industry outreach.

The optics program is multidisciplinary, with the College of Optical Sciences forming the core. The program targets three critical areas: photonics (red), imaging (blue), and astronomical optics



James C. Wyant, Ph.D.
Dean, College of Optical Sciences

PERFORMANCE MEASURES

PERFORMANCE MEASURES (\$ IN MILLIONS)	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Proj	FY07 Actual	FY08 Proj	FY08 Actual	FY09 Proj	FY09 Actual	FY10 Proj	FY11 Proj
RETURN ON INVESTMENT													
Sponsored Awards	\$11.325	\$3.398	\$19.94	\$2.428	\$9.677	\$16.000	\$21.749	\$16.350	\$31.042	\$16.700	\$36.499	\$25.000	\$25.500
Gifts & Other Sources	\$ 0.096	\$0.019	\$0.110	\$0.019	\$0.080	\$ 0.017	\$ 0.041	\$ 0.034	\$ 0.224	\$ 0.228	\$ 0.269	\$ 0.232	\$ 0.236
Patent Royalty Income						\$ 0.055	\$ 0.050	\$ 0.060	\$ 0.102	\$ 0.065	\$ 0.085	\$ 0.070	\$ 0.075
WORKFORCE CONTRIBUTIONS													
New Faculty Hires	3	6	0	1	1	2	3	2	1	2	4	2	2
Growth in optics-related undergraduate enrollment	12	25	44	25	(12)	4	(40)	6	(5)	4	(3)	4	4
Growth in optics-related graduate enrollment	30	15	21	0	23	3	15	4	(4)	3	22	4	4
Growth in optics-related distance learning enrollment	3	48	32	32	23	5	(8)	8	(34)	8	(11)	2	2
TECHNOLOGY TRANSFER & COLLABORATIONS													
New Start-up Companies	2	1	0	0	1	0	0	1	1	0	2	0	1
Patent Applications	15	15	10	17	23	7	21	8	45	15	49	30	32
Invention Disclosures						25	27	27	30	29	34	31	33
OUTREACH & EDUCATION													
Workshops, Seminars and Conferences Supported	7	5	6	6	15	5	17	5	8	5	6	6	6

Explanation of ROI Calculations:

ROI calculation for FY02 through FY06: Annual New federally funded major optics projects plus New industrial funded major optics projects plus New affiliate sponsors obtained (in \$'s) divided by annual TRIF Optical Sciences and Technology Program Total Expenditures .

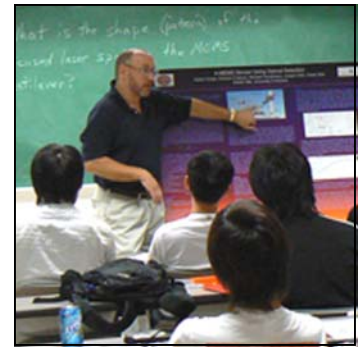
ROI calculation for FY07 to FY11: Annual Sponsored Awards plus Patent Royal Income plus Gifts & Other Sources divided by annual TRIF Optical Sciences and Technology Program Total Expenditures. Sponsored Awards, Patent Royalty income and Gifts & Other Sources (i.e. Affiliates funding) included for university personnel receiving TRIF Optical Sciences and Technology Program funding as defined in the ABOR approved ROI Formula

PERFORMANCE ANALYSIS

Research and Technology Development portion of the TRIF Optical Sciences and Technology Program focuses on development of novel photonic and imaging/sensor components along with state of the art astronomical optics through the use of seed funding and matching funds for projects that are designed for prototyping and/or proof of concept for early stage technologies. The number of externally funded research awards and technology transfer transactions are direct measures of this activity.

Workforce Development is a major objective of the TRIF Optical Sciences and Technology Program at the University of Arizona. The measures of the optics workforce development include the development of two-year degree programs at community colleges, expansion of undergraduate/ graduate and distance learning programs, fellowships to support graduate research projects, development of new courses for industrial training purposes, and outreach to K-12.

Technology Transfer and Industry Outreach is defined by collaborations with our optics industry partners in the development and commercialization of new technology, affiliate sponsorships, development of industry related training courses and distance learning program, and new start-up companies.



OSC's Dr. Mike Nofziger hosts a week-long summer school for students from the University of Toyota.

Educational Outreach is intended to introduce students to various career opportunities in Optics through visits to K-12 and community colleges with a special focus on under-represented populations, workshops and optics summer camps, and symposiums in imaging and photonics.

FINANCIAL INFORMATION

	FY02 Actual	FY03 Actual	FY04 Actual	FY05 Actual	FY06 Actual	FY07 Actual	FY08 Actual	FY09 Revised Budget	FY09 Actual	FY10 Revised Budget	FY11 Revised Budget
REVENUE											
Carry Forward	\$ -	\$ 1,535,952	\$ 324,825	\$ 366,298	\$ 1,230,225	\$ 135,586	\$ 594,471	\$ 852,429	\$ 852,429	\$ (72,014)	\$ -
New TRIF Revenue	\$ 4,395,646	\$ 4,803,518	\$ 4,521,523	\$ 4,491,847	\$ 4,047,769	\$ 3,646,492	\$ 3,598,915	\$ 3,476,034	\$ 2,718,259	\$ 2,656,045	\$ 2,656,045
TOTAL REVENUE	\$ 4,395,646	\$ 6,339,470	\$ 4,846,348	\$ 4,858,145	\$ 5,277,994	\$ 3,782,078	\$ 4,193,386	\$ 4,328,463	\$ 3,570,688	\$ 2,584,031	\$ 2,656,045
EXPENDITURES											
Personal Services	\$ 1,004,904	\$ 1,781,270	\$ 2,688,414	\$ 2,209,066	\$ 2,575,898	\$ 2,143,214	\$ 2,143,012	\$ 3,842,346	\$ 2,451,017	\$ 2,297,914	\$ 2,369,928
All Other Operating Expenses	\$ 854,790	\$ 3,233,375	\$ 791,636	\$ 418,854	\$ 1,566,510	\$ 1,044,393	\$ 1,197,945	\$ 486,117	\$ 1,191,685	\$ 286,117	\$ 286,117
Capital	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
TOTAL EXPENDITURES	\$ 2,859,694	\$ 6,014,645	\$ 4,480,050	\$ 3,627,920	\$ 5,142,408	\$ 3,187,607	\$ 3,340,957	\$ 4,328,463	\$ 3,642,702	\$ 2,584,031	\$ 2,656,045
Return on Investment	4.0:1	0.6:1	4.5:1	0.7:1	1.9:1	6.8:1	9.4:1	3.9:1	10.1:1	9.8:1	9.7:1

Notes:

1) Return on investment (ROI) for FY 2007-2011 was calculated using a new methodology approved by the Arizona Board of Regents in March 2007, which is different from the ROI methodology used to calculate ROI in FY 2002-2006.

2) Funding of the Arizona Board of Regents' Technology and Research Initiative Fund (TRIF) is provided by a 0.6 percent increase in the Arizona sales tax rate approved by the voters through Proposition 301 on the November 2000 general election ballot.

GOALS

The TRIF Optical Sciences and Technology Program will promote the field of optics by:

- The development of new technologies in Photonics, Imaging and Sensors and Astronomical Optics
- Working closely with our industry partners and the

University Office of Technology Transfer to identify research products that have potential for technology transfer

- Increasing the number of Optics related spin-off companies

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GOALS

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- Supporting workforce development through continued expansion of instructional and outreach programs in K-12 and community colleges, providing fellowships to support graduate student research in imaging and photonics, expansion of the graduate,

undergraduate, and distance learning Optics programs, development of new course curriculums to meet industry needs, and further expansion of the MBA/Masters in Optics program

- Developing a special focus on under-represented populations to introduce them to optics careers
- Increasing the number of world-class faculty in optics and the number of major optics research projects

MANAGEMENT

Dr. James C. Wyant, Chair of the TRIF Optics Committee, reports to **Dr. Leslie Tolbert**, Vice President for Research, Graduate Studies and Economic Development, for the TRIF Optics Program.

ADVISORY BOARDS

TRIF Optics Committee

James C. Wyant (Chair): Dean and Professor; Optical Sciences, Professor; Electrical & Computer Engineering.
Arthur F. Gmitro: Professor; Radiology and Optical Sciences.
Jeffrey B. Goldberg: Dean; Engineering, Professor; Systems & Industrial Engineering. **Nasser Peyghambarian**: Professor; Optical Sciences, Materials Science & Engineering, Chair; Lasers & Photonics. **Joaquin Ruiz**: Dean; Science, Professor; Geosciences.

External Review Committee

Bruce Wright (Chair): UA Associate Vice President; Economic Development. **Robert Breault**: CEO; Breault Research Organization. **Richard Juergens**: Engineering Manager; Raytheon. **Glenn Sincerbox**: Professor Emeritus; Optical Sciences.

TRIF Astronomical Optics Faculty Advisory Committee

Peter Strittmatter (Chair): Department Head; Astronomy, Regents' Professor; Astronomy, Director; Steward Observatory. **J. Roger P. Angel**: Regents' Professor; Astronomy and Optical Sciences. **James H. Burge**: Professor; Optical Sciences and Astronomy.
Jose Sasian: Professor; Optical Sciences and Astronomy.

TRIF Optics/Imaging Faculty Advisory Committee

Arthur F. Gmitro (Chair): Professor; Radiology and Optical Sciences. **J. Roger P. Angel**: Regents' Professor; Astronomy and Optical Sciences. **Jennifer K. Barton**: Associate Professor; Biomedical Engineering, Electrical & Computer Engineering, Optical Sciences. **Robert H. Brown**: Professor; Planetary Sciences. **Eustace L. Dereniak**: Professor; Optical Sciences. **Michael R. Descour**: Associate Professor; Optical

Sciences. **James T. Schwiegerling**: Associate Professor; Ophthalmology and Optical Sciences.

TRIF Optics/Photonics Faculty Advisory Committee

Nasser Peyghambarian (Chair): Professor; Optical Sciences, Materials Science & Engineering, Chair; Lasers & Photonics.
Neal R. Armstrong: Professor; Chemistry and Optical Sciences. **Jerome V. Moloney**: Professor; Applied Mathematics and Optical Sciences. **Joseph Simmons**: Department Head and Professor; Materials Science & Engineering, Professor; Optical Sciences. **Masud Mansuripur**: Professor; Optical Sciences, Chair; Optical Data Storage Center.



LEARN MORE

- Contact **Dr. James C. Wyant**, Dean, College of Optical Sciences at jcwyant@optics.arizona.edu or 520-621-2448
- Contact **Dr. Leslie Tolbert**, Vice President for Research, Graduate Studies and Economic Development, at tolbert@email.arizona.edu or 520-621-3513
- Visit the College of Optical Sciences Website at www.optics.arizona.edu

