REPORT D	Form Approved OMB No. 0704-0188		
Public reporting burden for this collection of this gathering and maintaining the data needed, an collection of informatic nursulding suggestions in collections as sure 2003.	tormation is estimated to average 1 hour per a complexing and review optime (cliedtion of it (or reducing this burger, 1). Addington Ha- U-302, and to the Onthe in Management and	response, including the time for re nformation. Send comments regain deuarters Services, Directorate for Budget, Paperwork Reduction Proj	eviewing instructions, searching existing data sources raing this burden estimate or ani, other aspect of this r Intormation Operations and Peocits, 1215 Jettersor ecc (0704-0188), Washington, OC 20503
Aris Highway Suite 1204 Arington, 74 222224307 and to the Ornan Changement and acuget Calendor Redenies on AGENCY USE ONLY (Leave blank) 2. REPORT DATE 3. REPORT TYPE AND BETNAT			D DATES COVERED
4. TITLE AND SUBTITLE		1 2.002	5. FUNDING NUMBERS
(DEPSCOR-92) Act Microscope	quisition of a Metallu	irgial Optical	60000000XX
5. AUTHOR(S)			61103D
Dr Krchnavek			5-0-7 20
7. PERFORMING ORGANIZATION N	AME(S) AND ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER
Washington Univ Campus Box 1127 St Louis, Misso	ersity uri 63130	AFO	SR-TR- 95 0115
SPONSORING MONITORING AG	ENCY NAME(S) AND ADDRESSIES	TIC	10. SPONSORING MONITORING AGENCY REPORT NUMBER
110 Duncan Avenue S Bolling AFB DC 203	MAR	ECTE 1 2 4 1995	F49620-93-1-0591
11. SUPPLEMENTARY NOTES		G	
		Ac	ccesion For
APPROVED FOR PUBLIC	C RELEASE: DISTRIBUTIO	N D UUNLIMITED J	TIC TAB
13. ABSTRACT Meximum 200 white	1.		Distribution /
			Availability Codes
		F	Avail and/or
SEE FINAL REPORT A	BSTRACT	l t	Dist Special
			A-1
		19950	322 152
		10000	
14. SUBJECT TERMS			15. NUMBER OF PAGES
			16 PRICE CODE
17. SECURITY CLASSIFICATION	16 SECURITY CLASSIFICATION	19 SECURITY CLASSIF	ICATION 20. LIMITATION OF ABSTR
OF REPORT	U- This PROC		

-02/24/95	15:2	9 2314 935 5862	HILLTOP-RE	SEARCH				004
Τ.	ITLE:	(DEPSCOR-92) Acquisiti	on of a Metallur	rgical Optic	al Micr	oscope	е	
• A1	UTHOR:	Dr Krchnavek	•		•			C
		Washington University	· .		FACE TD.	05	0115	
		St Louis, Missouri 6	3130	, A	LADU-IN-	70	UII)	
۴	49620-9	93-1-0591	FINAL F	REPORT				
					_	-		

2

This DEPSCoR award was an equipment grant to acquire a high-performance metallurgical microscope with optical imaging analysis capability. The system assembled includes a high-power optical microscope, a visible and infrared ($\lambda < 1.6 \mu m$) imaging system, computerized analysis of video images, and Michelson interferometer and Abbe refractometer components for characterizing optical materials.

The equipment is currently being utilized by two groups studying materials. The Photonics Research Laboratory is studying organic polymer materials for photonic applications (Fundamental Characterization of Advanced Organic Polymers for Optical Waveguide Devices, F30602-94-C-0006 and A Study of Birefringence in Poled Films of Advanced Organic Polymers, F30602-95-C-0024). The photonics group is also studying excimer laser chemical vapor deposition of semiconductor nanocrystals for optical applications. The Magnetics Information Science Center is using the equipment to analyze magnetic recording head structures.

Equipment List

The \$63,642.00 grant with matching funds of \$3,350.00 was used to purchase the equipment described below. The final pieces of equipment were in place in October, 1994.

Olympus BX60 optical microscope system (infinity corrected reflecting/transmitting optical microscope with Nomarski interference contrast, polarized light, brightfield, darkfield, objectives (5X, 10X, 20X, 50X, 100X), magnification changer, illumination systems, camera mounts, auto-exposure system, visible camera system.)	\$25,793.00
Infrared imaging system (Hamamatsu IR Vidicon system, monitor, zoom lens system, illuminators, low-power microscope, adapters.)	\$18,804.35
Computer acquisition and analysis system (computer with video capture board, video printer, hard drive for image storage, image analysis computer with software, printer, cart)	\$12,986.3 <i>5</i>
Miscellaneous components (precision xyz-translation stages for sample manipulation, rotation and tilt stages for sample manipulation, infrared viewers, stereo-zoom, optical and mechanical components for Michelson interferometer, refractometer components)	\$9,408.30

Publications

This equipment has played a significant role in our research programs. Several publications that have benefitted from the equipment are under preparation. The following publications contain information obtained through the use of this equipment:

C. F. Kane and R. R. Krchnavek, "The Processing and Characterization of Benzocyclobutene Optical Waveguides," *IEEE Transactions on Components, Packaging and Manufacturing Technology for Advanced Packaging*, accepted for publication.

C. F. Kane and R. R. Krchnavek, "Benzocyclobutene Optical Waveguides," IEEE Photon. Technol. Lett., in press, May, 1995.

9 2/24	4/95 15:29	5 314 9	35 5862		HILLTOP-RESEAR	СН		
	TITLE: (DEPSCOR-92)	Acquisition	of	a Metallurgica	1 Optical	Microscope	
ı	AUTHOR:	Dr Krchnave	k		-	-	•	
	1	Washington	University _		•			
	,	St Louis,	Missouri 631.	30				
	F49620-93	-1-0591	•		FINAL REPORT			

This DEPSCoR award was an equipment grant to acquire a high-performance metallurgical microscope with optical imaging analysis capability. The system assembled includes a high-power optical microscope, a visible and infrared ($\lambda < 1.6 \mu$ m) imaging system, computerized analysis of video images, and Michelson interferometer and Abbe refractometer components for characterizing optical materials.

The equipment is currently being utilized by two groups studying materials. The Photonics Research Laboratory is studying organic polymer materials for photonic applications (Fundamental Characterization of Advanced Organic Polymers for Optical Waveguide Devices, F30602-94-C-0006 and A Study of Birefringence in Poled Films of Advanced Organic Polymers, F30602-95-C-0024). The photonics group is also studying excimer laser chemical vapor deposition of semiconductor nanocrystals for optical applications. The Magnetics Information Science Center is using the equipment to analyze magnetic recording head structures.

Equipment List

The \$63,642.00 grant with matching funds of \$3,350.00 was used to purchase the equipment described below. The final pieces of equipment were in place in October, 1994.

Olympus BX60 optical microscope system (infinity corrected reflecting/transmitting optical microscope with Nomarski interference contrast, polarized light, brightfield, darkfield, objectives (5X, 10X, 20X, 50X, 100X), magnification changer, illumination systems, camera mounts, auto-exposure system, visible camera system.)	\$25,793.00
Infrared imaging system (Hamamatsu IR Vidicon system, monitor, zoom lens system, illuminators, low-power microscope, adapters.)	\$18,804.35
Computer acquisition and analysis system (computer with video capture board, video printer, hard drive for image storage, image analysis computer with software, printer, cart)	\$12,986.35
Miscellaneous components (precision xyz-translation stages for sample manipulation, rotation and tilt stages for sample manipulation, infrared viewers, stereo-zoom, optical and mechanical components for Michelson interferometer, refractometer components)	\$9,408.30

Publications

This equipment has played a significant role in our research programs. Several publications that have benefitted from the equipment are under preparation. The following publications contain information obtained through the use of this equipment:

C. F. Kane and R. R. Krchnavek, "The Processing and Characterization of Benzocyclobutene Optical Waveguides," *IEEE Transactions on Components, Packaging and Manufacturing Technology for Advanced Packaging*, accepted for publication.

C. F. Kane and R. R. Krchnavek, "Benzocyclobutene Optical Waveguides," IEEE Photon. Technol. Lett., in press, May, 1995. 004