

## **OPTICAL 3D SURFACE INSPECTION**

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Non-destructive dimensional inspection of surfaces is an issue of utmost importance in a large number of situations in R&D and at the industrial world. An increasing number of surfaces and surface types must be microtopographically characterized in a non-destructive non-invasive way. Statistical parameters, both 2D and 3D, are fundamental to a useful quantitative characterization of the surface' relief. However the two and tridimensional magnified representation of the microtopographic structure of the surface, allowing a comfortable and detailed visualization of the relief structure, gives very meaningful insights and is more and more requested. Increasing computer processing power and speed and new software allows our days a very efficient visual inspection of the results of the microtopographic inspection of surfaces and parts. Optical triangulation in different approaches allow the establishment of metrological systems that by its inherent relative simplicity versatility robustness and reliability can cope with most modern requirements of the non-invasive inspection of objects and surfaces both smooth or rough. In this communication we will present a brief review of the work done at the Microtopography Laboratory of the Physics Department of the University of Minho in Portugal, on the optical triangulation based microtopographic inspection of surfaces.



# ICMST 2016

## PROGRAM SCHEDULE

### SUNDAY, 5 June 2016

TIME	PROGRAM
8.30 AM- 4.30 PM	REGISTRATION
4.30 PM-6.00 PM	PUBLIC LECTURE: <b>Prof. Ravi Subrahmanyam</b> <i>(Director, Raman Research Institute, Bangalore, India)</i>

## MONDAY, 6 June 2016

TIME	PROGRAM	
8.00 AM-9.30 AM	REGISTRATION	
9.45 AM-10.45 AM	Opening Ceremony	
10.45 AM-11.00 AM	<i>Coffee Break</i>	
11.00 AM-12.00 PM	PLENARY LECTURE-1 <b>Prof. Ada E Yonath ( Nobel Laureate)</b> <i>(Weizmann Institute, Rehovot, Israel)</i>	
12.00 PM-1.00 PM	PLENARY LECTURE-2: <b>Prof. Klaus von Klitzing ( Nobel Laureate)</b> <i>(Max –Planck-Institut, Für, Festkörperforschung, Germany)</i>	
1.00 PM-2.00 PM	<i>Lunch Break</i>	
2.00 PM-2.30 PM	KEYNOTE LECTURE-1: <b>Dr. Reji John</b> <i>(Head, Materials Engineering                      Division DRDO, NPOL, India)</i>	KEYNOTE LECTURE-2: <b>Dr. Lisa George</b> <i>(Madison Area Technical College,                      Madison, USA )</i>
2.30 PM-3.00 PM	KEYNOTE LECTURE-3: <b>Dr. Radhakrishna Prabhu</b> <i>(Robert Gordon University                      Aberdeen, United Kingdom)</i>	KEYNOTE LECTURE-4: <b>Prof. Krish Bharuth-Ram</b> <i>(University of KwaZulu-Natal                      Durban, South Africa )</i>
3.00 PM-3.20 PM	INVITED TALK-1: <b>Dr. Pratap Kollu</b> <i>(University of Cambridge, UK)</i>	INVITED LECTURE-2: <b>Dr. Sukhendu Mandl</b> <i>(IISER-Trivandrum, India)</i>

3.20 PM-3.40 PM	<b>INVITED TALK-3:</b> <b>Dr.N.Vijayan</b> <i>(National Physical Laboratory -New Delhi, India)</i>		<b>INVITED TALK-4:</b> <b>Dr.Bonige.Kishore Babu</b> <i>(Andhra University Andhra Pradesh, India)</i>		
3.40 PM-3.50 PM	<i>Coffee Break</i>				
3.50 PM-7.10 PM	<b>ORAL PRESENTATIONS</b>				
	<b>Hall 1</b>	<b>Hall 2</b>	<b>Hall 3</b>	<b>Hall 4</b>	<b>Hall 5</b>
	AO 505	BO 510	CO 506	DO 517	FO 511
	AO 512	BO 552	CO 509	DO 520	FO 518
	AO 516	BO 562	CI 519	DO 557	FO3115
	AO 521	BO 579	CO 522	DO 570	FO 523
	AO 528	BO 588	CO 535	DO 583	FO 527
	AO 532	BO601	CO 537	DO 592	FO 538
	AO 533	BO 3024	CO 541	DO 599	FO 566
	AO 546	BO 3037	CO 542	DO 3072	FO 580
	AO 568	BO 3038	CO 544	DO 3093	FO 585
	AO 571	BO 3064	CO 560	DO 3095	FO 3002
	AO 573	BO 3068	CO 578	DO 3157	FO 3010
	AO 575	BO 3071	CO 590	DO 3163	FO 3012
	AO 581	AO 3188	CO 596	DO 3185	FO 3021
AO 590	AO 3192	CO 602	DO 3186	FO 3025	

	AO 600	AO 3198	CO 3000	DO 3189	FO 3119
	AO 606	AO 3205	CO 3016	DO 3190	FO 3026
	AO 612	AO 3207	CO 3022	DO 3191	FO 3029
	AO 3004	AO 3212	CO 3028	DO 3227	FO 3030
	AO 3005	FI 516	CO 3033	DO 3246	FO 3035
	AO 3015	DO 565	FI 526	EO 608	FO 3046
7.00 PM-8.00 PM	<b>POSTER PRESENTATIONS</b>				
	AP 503	AO 592	AP 1072	DP 505	EP 550
	AP 508	BP 534	CP 512	DP 507	EP 564
	AP 509	BP 548	CP 546	DP 523	EP 588
	AP 524	BP 593	CP 572	DP 537	EP 1153
	AP 525	BP 1031	CP 577	DP 538	EP 1179
	AP 527	BP 1086	CP 583	DP 539	EO 530
	AP 529	BP1115	CP 607	DP 540	EO 3000
	AP 536	BP 1117	CP 1010	DP 551	EO 3154
	AP 541	BP 1171	CP 1059	DP 553	EO 3181
	AP 545	AP 610	CP 1061	DP 558	EO 3213
	AP 554	AP 617	CP 1083	DP 573	EO 3220
	AP 559	AP 620	CP 1121	DP 579	FP 504
	AP 560	AP 621	CP 1172	DP 612	FP 511

	AP 562	AP 626	CP 1173	DP 614	FP 515
	AP 563	AP 1008	CP 1183	DP 615	FP 517
	AP 568	AP 1035	CP 1214	DP 628	FP 518
	AP 1099	AP 1039	CP 1231	DP 1006	FP 520
	AP 574	AP 1040	CP 1232	DP 1014	FP 526
	AP 580	AP 1041	CO 593	DP 1045	FP 528
	AP 591	AP 1042	CO 603	DP 1053	FP 530
	AP 592	AP 1046	CO 3028	DP 1057	FP 531
	AP 596	AP 1047	CO 3150	DP 1098	FP 532
	AP 598	AP 1060	CO 3172	DP 1108	FP 533
	AP 605	AP 1071	DP 621	DP 1141	BO 3000
	BP 627	DP 630	DO 3047	DO 613	DO 3049

## TUESDAY, 7 June 2016

TIME	PROGRAM
9.00 AM- 9.50 AM	PLENARY LECTURE-3: <b>Prof. Dr. Katharina Al-Shamery</b> <i>(Carl von Ossietzky University Oldenburg Germany)</i>
9.50 AM-10.40 AM	PLENARY LECTURE- 4: <b>Dr. John Philip</b> <i>(Head, SMARTS&amp;RTS, Metallurgy and Materials Group, IGCAR-Kalpakkom, India)</i>

10.40 AM-10.50 AM	<i>Coffee Break</i>	
10.50 AM-11.40 AM	<p>PLENARY LECTURE- 5:  <b>Prof. Spiros H Anastasiadis</b>  <i>(Director, Institute of Electronic Structure and Laser, Greece)</i></p>	
11.40 AM-12.30 PM	<p>PLENARY LECTURE- 6:  <b>Prof. Dr. Peter Baeuerle</b>  <i>(Director, Institute of Organic Chemistry II and Advanced Materials, Ulm University, Germany)</i></p>	
12.30 PM-1.30 PM	<i>Lunch Break</i>	
1.30 PM-2.00 PM	<b>Hall-1</b>	<b>Hall-2</b>
	<p>KEYNOTE LECTURE-5:  <b>Dr. P K Panda</b>  <i>(CSIR-National Aerospace Laboratories, Bangalore, India)</i></p>	<p>KEYNOTE LECTURE-6:  <b>Prof. Constantinos Simserides</b>  <i>(Dept. of Solid State Physics National and Kapodistrian University of Athens , Greece )</i></p>
2.00 PM-2.30 PM	<p>KEYNOTE LECTURE-7:  <b>Dr. Sandeep Kumar</b>  <i>(Raman Research Institute Bangalore, India)</i></p>	<p>KEYNOTE LECTURE-8:  <b>Prof. M Padmanabhan</b>  <i>(Amrita University Kerala, India)</i></p>
2.30 PM-3.00 PM	<p>KEYNOTE LECTURE-9 :  <b>Dr. CV Tomy</b>  <i>(Head, Dept. of Physics, IIT Bombay)</i></p>	<p>KEYNOTE LECTURE-10:  <b>Prof. Dr. Mohd Kamarulzaki Mustafa</b>  <i>(Deputy Dean of R&amp;D, Universiti Tun Hussein Onn, Malaysia)</i></p>

3.00 PM-3.20 PM	<b>INVITED TALK-5:</b> <b>Dr. Kishore Sridharan</b> <i>(Dept. of Physics  NIT- Karnataka, India)</i>	<b>INVITED TALK -6:</b> <b>Dr. Amal Kumar Das</b> <i>(Department of Physics  IIT Kharagpur, India)</i>			
3.20 PM- 3.40 PM	<b>INVITED TALK -7:</b> <b>Dr. Diby Paul</b> <i>(Konkuk University, SEOUL,  South Korea)</i>	<b>INVITED TALK -8:</b> <b>Dr. Madhavan Jaccob</b> <i>(Loyola College  Chennai – India)</i>			
3.40 PM-3.50 PM	<i>Coffee Break</i>				
3.50 PM-6.20 PM	<b>ORAL PRESENTATIONS</b>				
	<b>Hall 1</b>	<b>Hall 2</b>	<b>Hall 3</b>	<b>Hall 4</b>	<b>Hall 5</b>
	AO 3018	AO 3214	CO 3056	DO 3250	FO 3238
	AO 3031	AO 3221	CO 3061	DP 1007	FO 3054
	AO 3063	AO 3231	CO 3070	EI 522	FO 3057
	AO 3089	AO 3247	CO 3125	EO 572	FO 3075
	AO 3099	AO 3252	CO 3131	EO 1000	FO 3086
	AO 3100	AO 3260	CO 3132	EO 1001	FO 3087
	AO 3102	AO 3262	CO 3161	EO 3078	FO 3107
	AO 3103	AP 1202	CO 3167	EO 3094	FO 3108
	AO 3109	FO 3164	CO 3173	EO 3158	FO 3112
	AO 3124	FO 3204	CO 3275	EO 3182	FO 3118
	AO 3133	CO 3215	CO 3178	CO 3200	FO 3134



	AO 3137	CO 3254	CO 3187	CO 3201	FO 3159
	AO 3141	CO 3257	CO 3196	CO 3202	FO 3203
	AO 3147	FO 3225	FO 3174	CO 3208	FO 3239
	AO 3184	FO 3245	FO 3226	FO 3180	FO 3240
6.00 PM-7.30 PM	<b>POSTER PRESENTATIONS</b>				
	AO 604	FP 594	FP 1056	FP1154	DP 1146
	AO 3000	FP 595	FP 1064	FP1157	DP 1215
	AO 3032	FP 597	FP 1074	FP1163	DP 1216
	AO 3040	FP 599	FP 1075	FP1165	FO 592
	AO 3044	FP 601	FP 1076	FP 1180	FO 3051
	AO 3050	FP 604	FP 1077	FP 1182	FO 3074
	AO 3101	FP 611	FP 1079	FP 1184	FO 3080
	AO 3104	FP 616	FP 1100	FP 1191	FO 3082
	AO 3105	FP 625	FP 1104	FP 1198	FO 3183
	AO 3110	FP 1009	FP 1111	FP 1199	FO 3228
	AO 3111	FP 1012	FP 1119	FP 1203	FO 3243
	AO 3197	FP 1013	FP 1122	FP 1204	AP1126
	AO 3248	FP 1015	FP 1124	FP 1206	AP 1131
	FP 1033	FP 1017	FP1125	FP 1211	AP 1150
	FP 1034	FP 1019	FP 1130	FP 1220	AP 1151

	FP 535	FP 1021	FP 1136	FP 1221	AP 1152
	FP 543	FP 1022	FP 1137	FP 1227	AP 1166
	FP 552	FP 1026	FP 1139	FP 1230	AP 1170
	FP 570	FP 1027	FP 1143	FP 3001	AP 1174
	FP 571	FP 1037	FP 1147	DO 598	AP1176
	FP 576	FP 1043	FP 1148	DO 605	AP 1186
	FP 582	FP 1044	AP 1093	DO 607	AP 1189
	FP 584	FP 1050	AP 1095	DO 610	AP 1193
	FP 585	FP 1052	AP 1096	DO 611	AP 1223
	FP 589	FP 1054	FP1149	DO 3047	AP 1224
	FP 590	FP 1055	FO 3253	DO 3049	AP 3003
	CO 3030	DP 1145	BO 3092	DO 3153	
7.30 PM-9.00 PM	<b>BANQUET DINNER</b>				

<b>WEDNESDAY, 8 June 2016</b>		
<b>TIME</b>	<b>PROGRAM</b>	
9.00 AM- 9.50 AM	PLENARY LECTURE- 7: <b>Prof. Norbert Kroo</b> <i>(Presidential Advisor, Hungarian Academy of Sciences, Hungary)</i>	
9.50 AM-10.40 AM	PLENARY LECTURE- 8 <b>Prof. Alison Downard</b> <i>(Mac Diarmid Institute for Advanced Materials and Nanotechnology, University of Canterbury, New Zealand)</i>	
10.40 AM-10.50 AM	<i>Coffee Break</i>	
10.50 AM-11.40 AM	PLENARY LECTURE-9: <b>Prof. Reji Philip</b> <i>(Light and Matter Physics Group, RRI- Bangalore, India)</i>	
11.40 AM-12.30 PM	PLENARY LECTURE-10: <b>Prof. Manuel Filipe Pereira da Cunha Martins Costa</b> <i>(University of Minho, Portugal)</i>	
12.30 PM-1.00 PM	<b>Hall-1</b>	<b>Hall-2</b>
	KEYNOTE LECTURE-11: <b>Prof. Manickam Mahendran</b> <i>(Thiagarajar College of Engineering, Madurai, India)</i>	KEYNOTE LECTURE-12: <b>Dr. Jai Singh</b> <i>(Dr.H.S.Gour Central University, Sagar, M.P, India)</i>
1.00 PM- 1.30 PM	<b>Valedictory function</b>	
1.30 PM-2.00 PM	<i>Lunch</i>	

