

**LBT Italian Coordination Facility** 

Adriano Fontana Roberto Speziali

Audizione INAF - 31 maggio 2021

## **LBT Governance**

MINN

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- Chick Woodward
- Buell Jannuzi
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- Roberto Ragazzoni
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## **Partners Coordinators**



Max-Planck-Institut für Radioastronomie – Bonn

## **USER Committee**

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## LBT



## **1° gen LBT Instrumentation**

	Instrument	Туре	Wavelength	AO
	LBC-B (Left)	Wild Field Imager	350 – 650 nm	
	LBC-R (Right)	Wild Field Imager	550 – 1000 nm	
VIS	MODS 1 (Left)	Imager / Spectrograph	320 – 1100 nm	
	MODS 2 (Right)	Imager / Spectrograph	320 – 1100 nm	
	PEPSI	Spectrograph / Polarimeter	383 – 907 nm	
	LUCI1 (Left)	Imager / Spectrograph	890 – 2440 nm	Х
NIR/MIR	LUCI2 (Right)	Imager / Spectrograph	960 – 2440 nm	Х
	LMIRCAM	Imager / Coronograph	3-5 µm	Х
	NOMIC	Imager	8-13 µm	Х

### (<u>https://lbt.inaf.it/instruments.html</u>) Facility/PI/Strategic

LBT has 9 instruments + 4 forthcoming (NIRVANA, 2xSHARKs,iLocater). The 4 VLTs have 14; Keck has 10

## **INAF - 2° gen LBT Instrumentation**

## SOUL: UPGRADING THE LBT SCAO PI Enrico Pinna



## INAF - 2° gen LBT Instrumentation SOUL: UPGRADING THE LBT SCAO PI Enrico Pinna

SR>10%

### FLAO

SOUL



Η

Κ

## INAF - 2° gen LBT Instrumentation

### SOUL-LUCI1: Commissioning Tech & Science completed

SR = 18% FWHM = 64x78mas



- 14/15 programs completed (8/9) INAF
- 10 papers: 1pub + 5(3)in prep + 4(1) exp.
- 70% efficiency (11,8/16.6h)

# INAF - 2° gen LBT Instrumentation SOUL: SHARK (NIR + VIS)

System for coronagraphy with High order Adaptive optics from R to K band





PI: Jacopo Farinato – INAF-OAPD

PI: Fernando Pedichini – INAF-OAR

## **LINC-NIRVANA**

MCAO IR imager Extension to visible being considered



## LBT Instrumentation timeline and birth of LBT-ITALIA



## LBT-ITALIA Team

### https://lbt.inaf.it/staff.html

Roberto Speziali	OAR	Partner Coordinator
Felice Cusano	OAS	Responsible for Service Obs./ Lead Observer (2012)
Andrea Rossi	OAS	Lead Observer (2015)
Simona Paiano	OAR	Observer (2020)
Nikolay Britavskiy	OAR	Observer (Sept. 2021)
Alessio Giunta	ASI	Observer (2018)
Roberta Carini	OAR	Observer (Rome Control Room)
Marco Faccini	OAR	Observer (Rome Control Room)
Diego Paris	OAR	Responsible for Imaging data Reduction and ICT
Adriana Gargiulo	IASF-MI	Resp. Spect. data reduction (2017)
Susanna Bisogni	IASF-MI	Spect. data reduction (2020)
Letizia Cassarà	IASF-MI	Spect. data reduction (2018)
Marco Fumana	IASF-MI	Spec. pipeline development
Vincenzo Testa	OAR	Responsible for the Italian TAC

### Former Team Members

Konstantina Boutsia 🗕 Instrumentation Scientist @ Magellan				
Eleonora Sani (2012 - 2015)	→ Support Astronomer @ ESO VLT			
Alida Marchetti - IASF MI				
Bianca Garilli – IASF MI	(spectroscopic reduction)			
Stefano Gallozzi - OAR	(LSC)			

#### IA2 Team members

Kristina Knapic	OATS
Martina Vicinanza	OAR
Sonia Zorba	OATS
Aassimo Sponza	OATS

### LBT ITALIA



## **INAF** Proposal pressure

Proposals #

8

# 2014-2015 INSTITUTE Hours INAF - OaS 112,40 18%

INAF - OAR	106,80	23%	7
INAF - OAPd	49,60	11%	5
INAF - Brera	114,00	24%	5
Uni - Bo	36,50	8%	3
INAF - OATe	13,10	3%	2
INAF - OAFi	12,20	3%	2
INAF - IAPS	5,40	1%	1
IASF MI	8,00	2%	1
INAF - OANA	9,00	2%	1
Uni - Pd	5,00	1%	1
	472		36

### 2017-2018

INSTITUTE	Hours		Proposals #
INAF - OAR	170,70	39%	11
INAF - OAS	163,80	37%	11
INAF - Brera	46,40	11%	4
INAF - IRA	18,20	4%	3
INAF - OACt	1,70	0%	1
INAF - OAPd	6,50	1%	1
INAF - OATo	5,00	1%	1
INAF - OACa	2,00	0%	1
INAF - IASF Mi	24,20	5%	1
Uni - Pd	2,30	1%	1
	440,80		38

INAF nights per year: ~45 = 430 Tel. hours

INSTITUTE	Hours		Proposals #
INAF - OaS	61,10	11%	10
INAF - OAR	157,60	38%	7
INAF - OAPd	58,10	14%	4
INAF - Brera	29,50	7%	3
INAF - OANA	13,80	3%	2
INAF - OATe	13,10	3%	2
INSTITUTE	Hours	%	Proposal #
OA - RM	232,95	22,809	69
OAS - BO	156,12	15,289	69
IASF-MI	112,00	10,969	66
OA - MI	141,09	13,819	64
OA - FI	127,46	12,489	64
OA - PD	50,00	4,89%	63
OA - NA	49,00	4,809	63
OA - TS	55,56	5,449	62
Normale	12,00	1,179	62
UNI - RM2	26,00	2,559	61
UNI - PD	20,00	1,969	61
ASI	31,36	3,079	61
OA - CT	8,00	0,789	61
	1021,55		46
INAF - OATo	8,00	1%	1
INAF - OACt	30,00	5%	1
INAF - IRA	11,00	2%	1
INAF - SSDC	10,24	2%	1
Uni - Pd	20,00	3%	1
Uni - RM1	12,00	2%	1
Uni - RM2	31,50	5%	1
Uni - RM3	20,00	3%	1
	577,16		37

2015-2016

### 2016-2017

INSTITUTE	Hours		Proposals #
INAF - OAS	148,50	15%	11
INAF - OAR	142,13	19%	9
INAF - OAPd	74,60	10%	5
INAF - Brera	25,80	3%	4
INAF - OACt	56,50	8%	4
Uni - Bo	16,40	2%	4
INAF - OATo	44,00	6%	3
INAF - OAFi	94,25	13%	3
INAF - OANa	12,50	2%	1
INAF - OATe	6,00	1%	1
INAF - OaTs	16,00	2%	1
INAF - OACa	10,60	1%	1
INAF - IASF Mi	24,00	3%	1
INAF - IRA	12,60	2%	1
Uni - Pd	6,00	1%	1
Uni - To	42,50	6%	1
Uni - RM3	13,50	2%	1
	745,88		52
2019-2020(2021)			

INSTITUTE	Hours		Proposal #
OA - RM	96,84	20%	7
OA - CT	102,00	21%	4
OA - TS	25,19	5%	3
OA - FI	42,92	9%	4
OA - MI	67,25	14%	5
IASF - MI	46,87	9%	4
UNI - PD	28,50	6%	3
OAS - BO	27,10	5%	4
OA - NA	24,50	5%	2
IRA - BO	15,00	3%	1
UNI - RM2	12,00	2%	1
OA - TO	6,00	1%	1
OA - PD	1,50	0%	1
	495,67		40

## PEPSI PETS: first all-partner survey with LBT





### The "PEPSI/LBT Exoplanet Transit Survey (PETS)"

P.I.: Klaus G. Strassmeier (AIP; kstrassmeier@aip.de; +49-331-7499-223)
Co-I(s): Christian Veillet (LBTO), Ilya Ilyin (AIP), Ji Wang (OSU), Scott Gaudi (OSU), Evgenya Shkolnik (ASU), Jennifer
Patience (UoA), Everett Schlawin (UoA), Daniela Sicilia (INAF), Lorenzo Pino (INAF), Luca Malavolta (INAF), Alessandro
Sozzetti (INAF), Aldo Bonomo (INAF), Francesco Borsa (INAF), Gaetano Scandariato (INAF), Valerio Nascimbeni (INAF),
Karan Molaverdikhani (LSW), Thomas Henning (MPIA), Fei Yan (MPIA), Katja Poppenhäger (AIP), Matthias Mallonn (AIP),
Engin Keles (AIP).

Summary of observing request for this project: total of 593 hrs distributed in 2021AB, 2022AB, and 2023AB.

Program start: Semester 2021A = Feb. 2021.



## **Telescope Pressure**



## **Instruments Request**



■ LBC ■ LUCI ■ MODS ■ LBTI ■ PEPSI









## **Proposals** (Total/completed)



## Large Programs (10 x year)



**AVG Max. Exposure Time x channel x year: 20-25 hours** 

## INAF Scientific Papers x year



## About Publications

Italy has a high variation in its production of 1<sup>st</sup> author papers...



## **INAF vs Partners**

- LBT PAPERS: 485
- PARTNERS: 370 INAF: 121 PI + 59Col
- External/Archive: 115







## Budget

- INAF direct contribution to LBT in 2020: 2.8M€
- LBTO personnel (~65 people),
- Operations, Instrument & telescope maintenance
- Budget LBT-Italia: ~200k€/year.
- Observing staff
- Data reduction staff
- Hardware for computing & archive
- Travels (observing runs)
- SHARKs total cost : ~ 3M€ over the last 5 years

## Conclusions: LBT #1

Provide INAF with an environment to develop AO technology and instruments

This aspect has been clearly a success:

- LBC has been the first light/binocular instrument of LBT and the only one working for the very first years;
- LBT has opened the era of Extreme-AO;
- The current leadership in the development of AO instrumentation has clearly leveraged on LBT experience;
- Current /near future instruments (SOUL, SHARKs) will maintain LBT leadership in AO instrumentation.

Upcoming goal

Improve the AO productivity with the forthcoming 2° generation instruments: as with PEPSI, the advent of the SOUL and SHARKs might benefit from dedicated observing campaigns

## Conclusions: LBT #2

Provide Italian astronomers access to 8m-telescope complementary to ESO

- Pressure of the community is definitely high;
- o By any metrics the scientific return is improving
- Italy the most productive partner
- o «Traditional» instrumentation still very competitive, especially LBC, MODS and PEPSI

Upcoming goal

Keep on increasing the publication rate

## **Conclusions: LBT-ITALIA**

An important environment to develop observing and instrumental capabilities that are crucial within INAF

It's a 24/7 operating structure with an heavy load being a «service» activity that in some case exceeds 50% of personal FTE (1 or 2 extra FTE required) and with a limited personal return that needs to be properly rewarded by INAF;

The current support level of LBT-ITALIA to the Italian community is crucial to maintain and increase its scientific productivity.

## About Publications

For the papers up to the end of 2016, one can see the evolution of citations over the last four years...

