

Introduction and Workshop Goals

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*Institute of High Energy Physics
Chinese Academy of Sciences*



Funding

- Situation:
 - NSFC Science Center grant, led by Yifang: 20 MRMB
 - Failed
 - Yifang still guarantees to support the project
 - 10 MRMB for CORE contribution
 - Additional R&D funding needs to be properly justified
 - Part of reasoning for today's meeting
 - Will continue to look for alternative funding sources
 - ATLAS NSFC grant, led by Zhengguo Zhao: 9 MRMB
 - Meeting in Qingdao: reduced from 10 MRMB to 9 MRMB
 - To apply in near future. Discussion about leadership of grant.
 - Possibly future LHC upgrade MOST fund



IHEP-NJU HGTD Interests

As presented at LAr IB meeting

- **Interested in making a large contribution to the HGTD project in general**
 - Sensor design and characterization (**on-going**)
 - Module assembly (including R&D) and stave loading
 - Bump bonding (**on-going**)
 - ASIC design (**on-going**)
 - TDAQ and Demonstrator (**on-going**)
 - Peripheral electronics ???
 - Test beams and irradiation (**on-going**)
 - Simulation and physics case **Who is joining?**



IHEP Deliverables?

- **Modules and staves**

- 50% of modules?
 - Need to assess needed resources
- Flex cables?

- **Electronics**

- Connectors?
- Peripheral boards?



Name	Activity	Position	FTE
Joao Guimaraes da Costa	Mngt + sensor + modules	Physics Faculty	50%
Juan Antonio Garcia	TDAQ + Demonstrator	Postdoc	30%
Jie Zhang	ASIC	Engineer	35%
Wei Wei	ASIC	Engineer	10%
Jinyu Fu	Mechanics	Engineer	30%
Yunpeng Lu	Module	Engineer	50%
Lianyou Shan	Module	Physics Faculty	70%
Feng Lv	Module	Physics Faculty	30%
MingYi Dong	Module	Engineer	30%
Xin Shi	Sensor	Physics Faculty	50%
Mei Zhao	Sensor	Engineer	50%
Ryuta Kiuchi	Sensor	Postdoc	50%
Yunyun Fan	Sensor	Postdoc	70%
Yuzhen Yang	Sensor	Postdoc	50%
Kewei Wu	Sensor	Student	50%
Yuhang Tan	Sensor	Student	50%
Liaoshan Shi	Sensor	Student	50%
Baohua Qi	Sensor	Student	70%
Zhijun Liang	Sensor + module	Physics Faculty	50%
Suyu Xiao	Sensor + test beam	Student	80%
Bo Liu	Sensor + test beam	Postdoc	30%
Mohamad Kassem Ayoub	Test beam	Postdoc	30%
Jingyi Liu	Test beam	Postdoc	30%
Kunlin Ran	Test beam	Student	30%
Xuai Zhuang	Test beam + HGTD Physics	Physics Faculty	20%
Yanping Huang	Test beam + HGTD Physics	Physics Faculty	20%
Ludovica Aperio Bella	HGTD Timing	Postdoc	30%

Physics
Faculty
7

Engineers
6

Postdocs
8

Students
6

Total: 27

Electronics
3

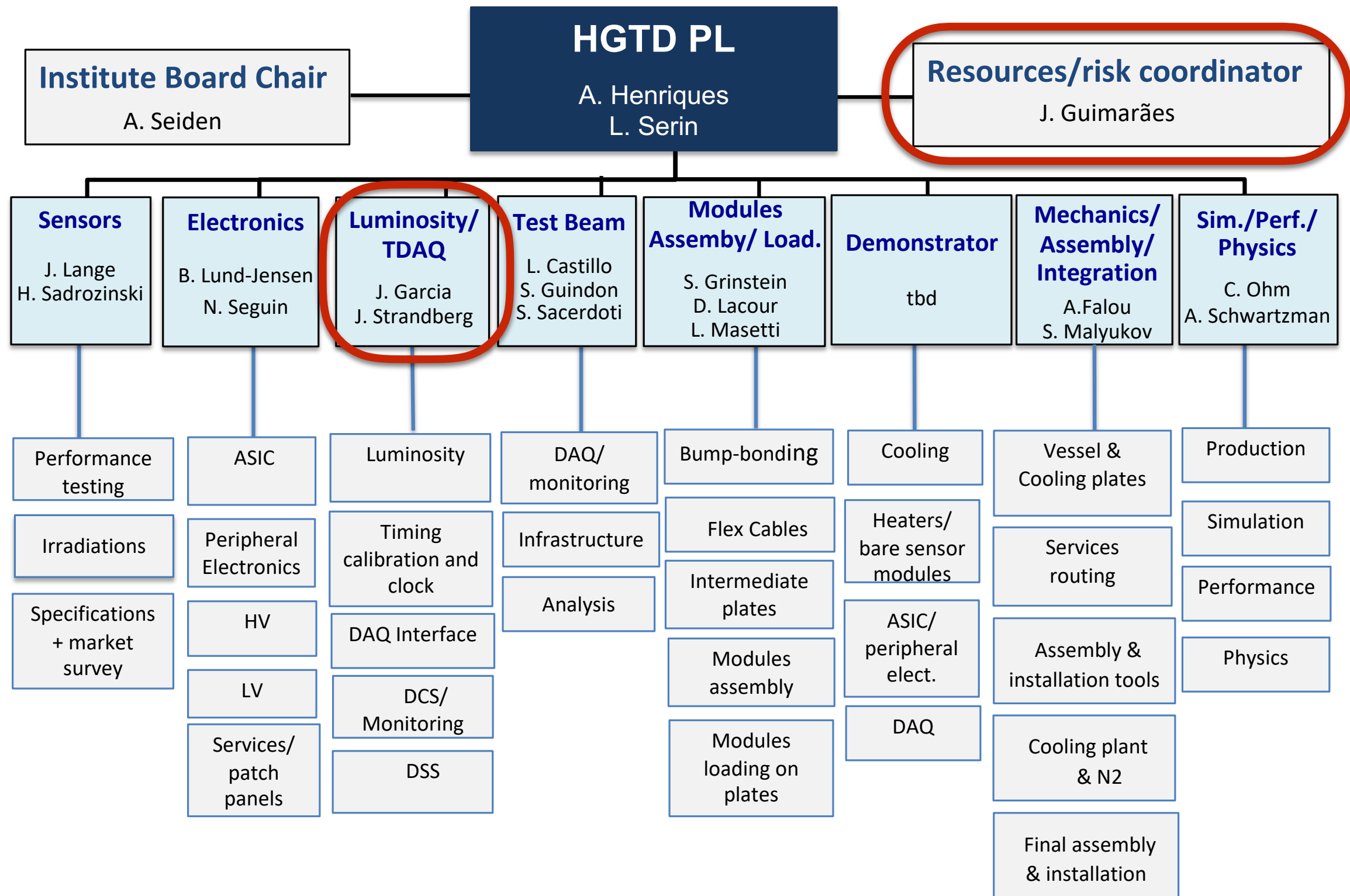
Module/
Mechanics
7

Sensors
13

Testbeam
Physics
8



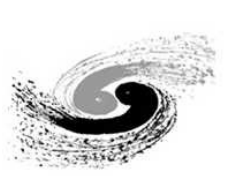
Coordination tasks





Final Remarks

- Goal of workshop: Overview of the current work status and better definition of our plans for the near future
- Prepare TDR: work needs to be mostly completed by September/October
 - What can we include
 - sensor tests
 - Flex cables, modules construction
 - module construction lab setup and procedure
 - DAQ and demonstrator work
 - mechanical design?
 - Overall schedule
- Timescales:
 - TDR contributions
 - Project contributions
- Consider seriously the possibility of building a full HGTD wheel at IHEP
 - Need to assess financial impact



Backup



Recognition

- We aim at maximizing our recognition for the participation in the project
- Two ATLAS-level leadership positions:
 - Level 1: Resources and Risk Manager (Joao)
 - Level 2: DAQ and Luminosity Coordinator (Juan Antonio)
- Our work was already presented at the LHCC on June 4
- ATLAS Week Plenary Talk: Thursday, June 20
 - Status of HGTD, Joao
- ATLAS and HGTD talks:
 - HGTD managers are asking for 6-7 names from IHEP to prioritize for ATLAS and HGTD talks depending on their involvement on the project



Nanjing University Team

Name	Activity	Position	FTE
Ming Qi	Electronics	Physics Faculty	50%
Xiaoli Ji	Electronics	Engineer Faculty	50%
to be recruited	Electronics	Postdoc	80%
Student 1	Electronics	EE Student	80%
Student 2	Electronics	EE Student	80%
Lei Zhang	Sensor + Test beam	Physics Faculty	50%
Shenjian Chen	Sensor + Test beam	Physics Faculty	30%
Shan Jin	Sensor + Test beam	Physics Faculty	10%
Liangliang Han	Sensor + Test beam	Student	40%
Bowen Zhang	Sensor + Test beam	Student	40%
Hanfei Ye	Sensor + Test beam	Student	40%
Yuhao Wang	Sensor + Test beam	Student	40%
Xiaozhong Huang	Software	Postdoc	40%

**Physics
Faculty**

4

Engineers

1

Postdocs

2

Students

6

Total: 13

- ASIC and peripheral electronics
 - Collaborating with SMU and IPAS
- Sensor test, test-beam, etc.
 - Use the facilities in NJU microstructure lab for sensor test



Electronics and ASIC

started

- **IHEP:**

- **TDAQ** (Juan Antonio Garcia coordinator) + **Demonstrator** at CERN
- **ASIC**: Working on radiation hard design of ASIC digital circuitry
 - Engineer currently in Barcelona working with Raimon, IFAE

- **Nanjing Univ:**

- Optical links and **peripheral** electronics (collaborating with SMU, IPAS)

Name	Position	FTE
Juan Antonio Garcia	Postdoc (IHEP)	30%
Jie Zhang	Engineer (IHEP)	30-40%
Xiaoli Ji	Professor EE (NJU)	50%
Ming Qi	Professor (NJU)	30%
Zhangnan Li	Student (NJU)	80%
Chang Liu	Student (NJU)	80%



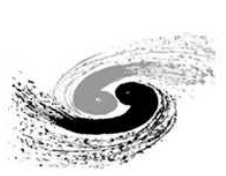
Current IHEP Sensor Team

Name	Position	FTE
Joao Guimaraes	Faculty	10%
Xin Shi	Faculty	50%
Zhijun Liang	Faculty	50%
Mei Zhao	Faculty	50%
Ryuta Kiuchi	Postdoc	50%
Yunyun Fan	Postdoc	70%
Bo Liu	Postdoc	30%
Yuzhen Yang	Postdoc	50%
Suyu Xiao	Student	80%
Kewei Wu	Student	50%
Yuhang Tan	Student	50%
Liaoshan Shi	Student	50%
Baohua Qi	Student	70%

Faculty: 4

Postdocs: 4

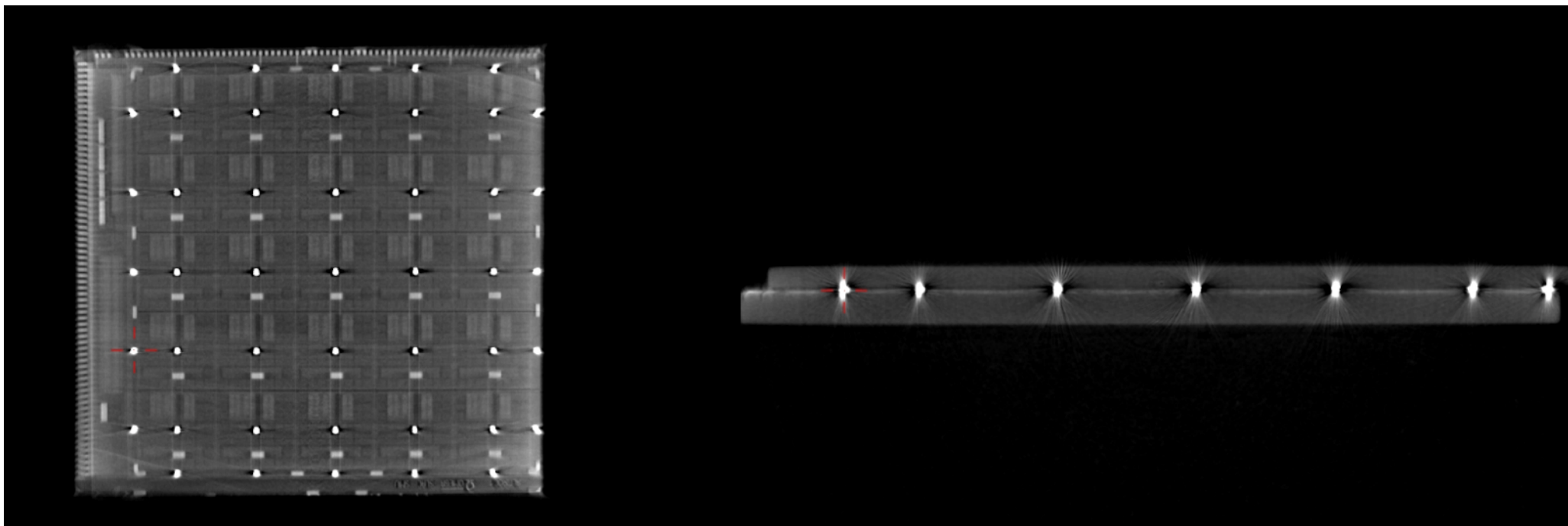
Students: 5



Bump bonding study

- Bump bonding quality is good according to 3D x-ray imaging
 - Pull testing in next step to check bump quality

Bare module



3D profile
X ray photo

Major concern from TDR review, but not considered very challenging by companies