

15th August, 2018

Present during call: Giles, Mariela, Somak and Stuart.

Updates on the on WP (WP1, WP2, WP3, WP4, WP5
from https://gilsay.physics.gla.ac.uk/dokuwiki/doku.php?id=ligo_india:start

-WP1:

- *Capture reports on projects being completed.*
- *IT have a website like LIGO to put in updates, Sajit deals with the websites on the India side, Somak will speak to Sanjit and see what happens.*

For follow up fundings, having good external visibility

Portal to channel de students: Channelling all the students ideas in one direction, with a website we could advertise this better

Somak: we have a mechanism for the Caltech program with Rana, I need to look to see who manages it, the surf program, it happens at the beginning of the year and only 5-6 are selected to work in Caltech. We should broaden this. LIGO India program. We've had meetings and we discussed how to set up a training program to visit various labs in a coherent fashion. This would be a good start to widen the program. We'll need to set up a formal program so students can visit other labs such as Glasgow, Germany, Australia and such. So we could start with UK.

Giles: We could set the program so that is done for the start of 2019, or just before Christmas. There could be a shortlist, followed by a Skype interview.

Giles: When the US program starts, you could take the UK into account for arranging this.

Somak: We might perhaps want to look at doing different timings, perhaps in June/July.

Giles: last couple of weeks in June and July would be ideal for the UK.

-WP2:

- *Nils noted that running WP activities at different times would be sensible.*
- *Python notebooks (workshop with Somak/Martin?), could link to tabletop interferometer and matched filters*
- *Focus on Machine Learning theme for data analysis and also start an effort in NR modelling involving fluids*
- *Actions from Glasgow Meeting:*
- *-Organise small, focus meetings to identify people to take on projects under these themes*
- *organise broader school under theme of multi-messenger?*

Somak: Reading through the notes on the website. Machine learning people were not present in the Glasgow meeting that we had. Martin mentioned around Feb/March. Good weather is Nov-Feb. We have some slots in Jan/Feb. We are hosting a space symposium in Pune in Feb. In Bangalore there will be machine learning session.

-WP3 Actions from Glasgow Meeting:

- *Work to engage with RRCAT on suspensions (through IUCAA). Possible visit of Glasgow person to RRCAT in 2018.*
- *Visit of Karthik' student to University of Strathclyde. Aim to develop Q measurement setup in India*
- *TIFR Hyderabad/IISER: development of mechanical setup for thermal noise measurements (linking to WP4)*

Giles: SW calls US/UK call and interspace is Australia call and the last call was very useful because there were a few RRCAT people in there and when I proposed to visit they seemed keen on this.

Somak: We've had some meeting with RRCAT since we last spoke. We had a program managing meeting two weeks ago. RRCAT is an official lab of atomic energy. This distinguishes it from other institutes like IUCAA. The more you are involve officially with the department of atomic energy the more difficult it is to organize visits. However, they are very keen to have people visit their labs for exchange technology collaborations. People will have to proposed this meetings and they can't be short notice. They are happy to officially host visit and they are aware that it will take time.

Giles: (Sendhil Raja- RRCAT) they are happy that in the future they will be able to speak on the pulling machine.

Stuart: Karthik student has been granted the UK visa ,so he will come to visit Strathclyde for a month around Sept-Oct.

-WP4:

Actions from Glasgow Meeting:

- *working setup for laser stabilisation (Ed/Umakant)*
- *Visit of senior student from Umakant's lab*
- *Visit of junior student to Cardiff (2019)*
- *Development of MOOC (Ed/Andreas)*
- *Possible FINESSE project in India. India to drive timescale (Andreas).*
- *IIT Madras Controls group to contact Andreas Freise (Umakant/Anil)*

Giles: Ed and Umakant were talking on visit for a student to work on the laser stabilization and they were looking at costing. On going activity.

Need to contact Andreas and ask regarding the machine learning workshop.

Somak: I will be there at the LVC so we can have small meeting. Will give the update on LIGO India.

Giles: It would be good to have a couple of slides on the LIGO STFC fund and have on the LIGO India update. Highlights of what we are doing, and what will be happening in the future.

-WP5:

Next meeting in India, have a 2 day scientific workshop and a 3rd day which is an industrially focussed workshop

- *Link to british Trade Embassy*
- *Actions from Glasgow Meeting*
- *Archani Pai/student who worked with Siong in Glasgow to give talk at Persistent Systems (link made through IUCAA)*
- *Somak/Umakant (IUCAA/IISER) to work with British Trade Embassy to organise trade event. Possibly December or January (to combine with Outreach)*
- *Links from Des Gibson*

On the first point Somak, Somak says they haven't engaged with Persistent systems. The thought was the student who came to Glasgow could present the work they had done in Glasgow to Persistent systems.

Somak: since issues in Persistent we haven't been able to engage properly with them, but we need to start talking to them again. All the junior people are there but a senior person needs to be involve. The meeting we are planning with Siong, Martin in January will need Persistent and other companies as well.

Entrepreneurial workshop: We got letters of supports from companies in the UK.

Somak: We need to speak to British trade Embassy.

Somak: Highlighted that we need to have a plan for engaging with industry with India. Within LIGO India it is becoming important to engage with Industry. Not just for what is important to us, but also to do Spinoffs and such. In India, in our normal grant applications we hadn't had this before, but the Indian government is now moving towards the importance.

Somak: We need to have industry contact, we don't have the point of contacts at the companies at the moment. We need to look at companies that do other things, for example optical things, micro measurements etc. We haven't started doing this at the Indian end.

Somak: the large fabrication of the TNT components are being made in India in addition to the control software. So we are involve with people who do optical and mechanical systems and we have been working with them. They might be interested in being involve. We need to engage the right division of the company to figure out whether they would work with us. I need to delegate to someone but it would be interesting to have a list of level of contact what companies and find what comparable companies we can talk to. If we get this grant I think it might still be doable, on a larger scale.

Larso and Tuburg – building the Indian components of ETER in France.

Giles: Could we use the British trade embassy contact to spread the work to engage with other companies?

Somak: the British trade office would know of UK companies with presence in India and vice-versa. Identify tasks and company, need to identify a person here to work with you. Over the next month or so we will have three more people joining. But I can ask people like Sukanta and Tarun to start this. I need a page description for the trade office so we can tell them what we are interested in. I am not sure they know what we are asking them to do, I think they are interested in being involve. I think we should made them an official partner on this.

Giles: We've put the British trade as a high up organization.

Somak: I think they are very interested in being involve but we need to give them more info. We haven't gone to them with a concrete plan yet.

Giles: This is a great opportunity as the Newton Bhabha has the entrepreneurial side. I think utilizing the newton -Bhabha and the GCRF as we build links with industry which will also suit the LIGO india need for industry links.

Opportunity of spinout gw research into industry and use that to highlight the opportunities in India. But we need to work on this.

Somak: Currently needs to be made as some LIGO India partners but not Ligo India (as to not involve institutes like RRCAT) so just involve institutes that are involved with the LIGO India research. And involve as many as possible. Mirror coating activities and others are coming up , particularly with the coating so we are now engaging more with companies. If we could have a list of spinoffs from GW so we can go to the British trade and show and state that we need to do the same here.

-WP6

- *List of activities coming up: 28 Feb National Science Day*
- *100th anniversary Eddington exhibition*
- *Awareness programmes in region around LIGO India site, region of poorer schools*
- *LIGO India Science Outreach Centre: possible exhibits?*
- *LIGO Science van (vans already exist), think about what is the contents of the van*

- *Indian schools: measure something very small would be useful, measure refractive index?*
- *Tabletop interferometer, Borja to draft and send around Sukanta/Umakant/Sanjit. Ed made contact with Jyoti Sharma at the Cluster Innovation Centre project in Delhi.*
- *Sanjit to send details of high end VR setup (purchase headsets from UK, laptop from India)*
- *Can Kai Stats movie be put into 3D viewable format (Suggestion from Martin)*
- *Karen noted viewing cards that give 3-D image of hardware*

Actions from Glasgow Meeting:

- *Re-work Nils' leaflet in local language, add some context to LIGO India. Add link to Sapce Time Quest*
- *Tabletop interferometer, Borja to draft and send around Sukanta/Umakant/Sanjit. Ed made contact with Jyoti Sharma at the Cluster Innovation Centre project in Delhi.*
- *List of activities coming up in india (e.g. National Science Day): February 28th 2019*
- *100th anniversary Eddington exhibition*
- *Hindustan Times article to promote Space Time Quest*

Andreas had mentioned they would do the translation of the leaflets to the different Indian languages in the next couple of months.

Borja has also applied for extra bonding to build tabletop interferometers that could get to Indian schools, master students at Uni level.

So there are actions on the first few items.

Giles: National science day; How do we add value from the Newton Bhabha side?

Somak: we have now hire 3 people here so we now have man power. We will have one person that will live on site so we will start lots of activities in the are. The first sky viewing had a bout 1000 people attending . We will slowly at the site start building outreach and build activities together with the schools. If we have EPO contacts that can produce product and direct involve them. Sanjit is our contact here and he's been involved on outreach things from Australia.

Giles/Somak: Need to follow up with Ed on the "*Jyoti Sharma at the Cluster Innovation Centre project in Delhi.*" But if someone gives me details I could contact this person. Jyoti works with kids gifted with math.

Somak: National science day in IUCAA we have about 10000 people and there are parallel events everywhere. If we do this meeting Feb we could combine with the meeting. Science day is the last day of Feb.

Updates on the LIGO India site?

Somak: LIGO updated: we have a huge discussion on Monday we had a big meeting in Mumbai . It looks like the 25% of the land is private and that's the ongoing at the moment 75% we've files all documents, it will take about 5 months. About 80% has been taken care of but apparently someone hadn't paid for the mortgage so that needs to be cleared before. The problematic area is fine now so maybe Sept-Oct we will have in our position almost all the line were the corner station will go. Some building activities may start soon. The important thing is that some geotechnical test must be done before. This is the first facility that will happen was we have position of the land. We have identified those doing the survey Aug-Sept.

AOB

Reminder email will be sent for the next meeting.