

19<sup>th</sup> November 2018

Present:

-Nils	-Sukanta
-Giles	-Suresh
-Mariela	-Borja
-Somak	-John Veich

There will be two workshops running parallel on the **18-19<sup>th</sup> of January**, one focused on data analysis and one on entrepreneurship (19<sup>th</sup> January). The workshop will be held in IUCAA Pune, India.

The entrepreneurial workshop will be a series of talks by several industry people showcasing their abilities and what they can offer as well as a talks from researches detailing their experience with working with industry and successful spin offs. Suggestions of talks are welcomed.

The data analysis workshop will be a series of lectures aimed at ~ 20 students and postdocs and thus will require your participation in delivering these.

#### 1 -Update on projects expenditure

*Mariela:* Update from Stuart: All the core items for the Q measurement tank have been purchased and are awaiting for their arrival. It would be helpful if Umakant and Karthik could start planning to send someone from their lab around Feb/March so that all parties can be involved in the commissioning of the system. Happy to discuss further via email and provide support letters for visa application.

*Giles:* Excellent, Nils did you have any further luck with LIGO pamphlet activities.

*Nils:* There is a draft translated version sitting with Sukanta, it needs some tweaks and I think is more or less done and I think we should be able to charge it to the grant before the end of the year. Not many changes have been made so it shouldn't be very expensive.

*Sukanta:* We are fitting in the text appropriately, we already have a draft at the moment and awaiting to get feedback from the local people on the site.

*Giles:* That's excellent, good to see. Any kind of material you would like to develop for say the Science day, is there any material that could be needed?

*Somak:* There is already a large number of poster, because there will be year long exhibition in collaboration with various other countries, There will be a big GW travel exhibit which goes around for a year all around the country, LIGO is one of the major components. The producing for the exhibition will come from the LIGO India money, but the various posters concentrate on the LIGO India and what's going to happen hardware/etc. We could mass produce this and send around education all around India. If we could have a condense version of like 3 posters out of these 20. And If universities/education can put them up then this would be an idea. We can use this and also send them to the UK and highlight the UK involvement. Giles, what is the deadline for the grant?

*Giles:* Realistically we need to charge by the end of the year.

*Somak:* the draft for the posters is more or less there, if we want to do a smaller version, we can talk amongst ourselves and I think thinks the content is all in place.

*Giles:* That's great if you can take it offline and let us know how much it would be then we could do something about it. We are already doing the same or in process with Anil. Also Martin had mentioned about the travelling exhibit, and having something that can move around the different Universities.

*Suresh:* For the National council of science museum that Somak was mentioning, RRCAT is building a travelling interferometer for this and could be linked with this.

*Giles:* there seems to be several Michelson interferometer with about 4 built from Glasgow, which will be delivered early in the next year, as well as Anil's, I wonder if we should get RRCAT and Anil together.

*Suresh:* I could look into this and we could see who to get in contact.

*Giles:* Yes, I will do that at the end of the call and put you in contact with Borja.

*Somak:* Training labs being set up in IUCCA and IIT madras, where we are hoping to set up for experiments with students. The other kind which will be the one travelling around with the exhibits, they will be built to demonstrate certain aspects of the interferometers. For example the RRCAT one will look at the suspended mirrors and stuff like that. That kind of approach is slightly different so I think we need the different interferometers being developed and I think it would be great to coordinate among all of them.

*Giles:* RRCAT might be very interesting if it utilizes suspension optics, Anil interferometer that could be made cheaply and could be sent to schools and the one in the UK could be used for teaching match filtering and such. I think that was everything on projects expenditure, and there are maybe a few other ideas, and there is money still left. So please email and fill in applications.

## 2 - Updated on WPS as per the wiki.

*Giles:* Next item is WPs updates but is there anything else we've missed that people have worked on?

*Suresh:* Umakant has sent an email with info.

*Raji:* We are trying to duplicate the TN system here as well. Umakant is trying to set up a facility at the moment to try and start the set up.

*Giles:* I think having the effort from both the UK and India is a great idea, as you can't have enough of these systems.

*Suresh:* If there's a plan to build a certain thing which is meant to come from the LIGO India money, and if there's an expectation where it is partially being funded here as well. We might run into a problem.

*Giles:* I think that's a good idea if you perhaps could get in contact with Umakant and Karthick and then we could add Stuart later one we could make sure that we are moving forward in the correct way. But I agree we need to be efficient with our resources and time.

*Suresh:* We are ordering a system, we are making a system on our own as well as waiting for the system from the UK. I will talk to Umakant and Raji and see what they are doing. Raji, are you planning on building everything for the Q measurement tank.

*Raji:* Yes, we are planning on building the whole thing from scratch,

*Somak:* Some of the money comes from the same so I think is being doubled.

*Raji:* Yes, one will be built for Umakant and one will be built from the LIGO India start up fund.

*Somak:* I think we need to have this discussion offline.

*Giles:* I think this is great to have this discussion. But let's move forward to talking about the workshop.

## 3- India Data analysis / Entrepreneurial workshop

*Giles:* There will be a multimedial workshop held in Lenovala, so the thought is that at the end of that meeting we will tackle on the data analysis and entrepreneurial workshop. The entrepreneurial side is something we want to develop with the Newton Bhabha.

*Mariela:* We have a few questions which would be great if you could answer.

Who is the best liaison for helping to organize these workshops?

*Somak:* Best liaison for organizing these workshops: I think Sukanta is already working on this.

*Sukanta:* For the data analysis that's very straight forward I can liaison on that. For the entrepreneurial side I've been working with some people in the British trade embassy and we are meeting some people tomorrow.

*Rajit:* What companies would you like to engage with?

*Giles:* Companies you would think would have a role to play for LIGO India.

*Somak:* I think this meeting tomorrow, is very crucial because we are meeting the people from Pune trade office but also the rep for Asia side and he's very interested in what is happening. So I think it would be great to give them ideas.

What I wanted to also say, we want companies involved in the various fabrications we will have in the fabrication here in India and also spin them into small companies, Glasgow has a lot of experience on this. Anything we develop which is kind of patentable, or produce end product out of them would be very good.

*Somak:* The British trade embassy has been working a lot between UK and Indian companies, many of the companies being from UK funded in India. There might also bring companies which aren't connected directly.

*Mariela:* In terms of the meeting location, can we have more information on this.

*Somak/Sukanta:* Multimesseger meeting Jan 15-18. The data/industry will be in Pune. The trade interaction is best held in Pune. So we'll start on Lenovala and then travel to Pune.

In terms of accommodation, IUCAA will arrange the accommodation within IUCAA unless u want to people in five star hotels.

*Giles:* Would the accommodation then be covered money by IUCCA? For UK participants, will it be covered by IUCAA or do we cover on the UK side?

*Somak:* Accommodation on this side we should charge to our part. For the company, some of them might choose to stay in hotels, and we can arrange that even from the everything from accommodations and expenditure can be cover in India.

*Borja:* Will there be outreach on the multi messenger meeting?

*Suresh:* Yes there might a session on that.

*Giles:* Persistent systems might be interesting to have them along, but there might be others you might want to add?

*Somak/Sukanta:* Yes they would be great to come, and other companies around the area might be interested to come along. I will ask the trade embassy what other companies could come along that are interested in links with research.

*Giles:* One thought is any follow up meeting that come from this one, say someone in the UK would like to come over to India, it might be nice if they could then support this type of activities.

*Somak:* I think that's a great idea, by showing that we are serious on this as we are putting money to start with but appreciate their abilities in facilitating this.

*Giles:* So the meetings, I thought these meeting would run parallel? The entrepreneurial workshop will start on the afternoon of the 18<sup>th</sup>, which I think the industry there would be important and that could be facilitated by the trade embassy, and have the UK and Indian companies talk to each other.

*Somak:* I would like to mention that the Trade embassy told me that many industries might be busy on the 18<sup>th</sup> we will talk to them tomorrow and figure out who will be busy, I will ask if it's worth.

*Somak:* I think for logistics it would be best to have them for a day, we could maybe do a one day.

*Giles:* OK then we do a say for the industry (19<sup>th</sup>) and up to a day a half (mid 18-19) for the data analysis.

*Giles:* Are we any forward with students from India coming to the UK through the portal?

*Suresh:* we have set up a portal for the Caltech portal, we will make a list of the student and direct them to the UK, give the list to the UK and they can make a decision. Typically the Caltech program is about 30 students and we send 3-6 students.

*Giles:* Excellent, Let us know if you need any information on our side.

#### 4 - AOB

*Giles:* Any other matter to be discussed? Otherwise, thank you for your time.