

17<sup>th</sup> September 2018

- Sukanta
- Nils
- Stuart
- Umakant
- Giles
- Mariela
- Peter
- Anil
- Siong
- Borja

The agenda will be:

1. Updates from the WP as per the wiki.
2. Update on ongoing projects/visit
3. Discussion on workshop on data analysis/entrepreneurship to set up date.
4. Important dates for UK people to visit India and help on outreach related issues such as "Science day"
5. Updates on British trade Embassy and companies.
6. OAB

1. Updates from the WP as per the wiki.

[https://gilsay.physics.gla.ac.uk/dokuwiki/doku.php?id=ligo\\_india:start](https://gilsay.physics.gla.ac.uk/dokuwiki/doku.php?id=ligo_india:start)

*Giles:* We've been trying to work out transfers of funds with Glasgow supporting 30% of the funds. It would be useful to know the status of the spent of funds. See the match funds, we haven't really don't that yet. We've been working on trying to get a hold of all the finances. Is it possible to get the finances from the India side? We are trying to get a spreadsheet with finances of both sides showing the in kind support with staff time, consumables etc. For future grant reports to facilitate the easy access and shared information.

*Sukanta:* I think we have some numbers to report on the in kind support on the form of personnel working for this project. I think we can prepare this in a spreadsheet. We don't have answer yet to what to do with any hardware that we buy, what would in kind mean from the Indian side?

*Anil:* Consumables would be real cash eg 10m prototype etc set up in India, that would be needed for LIGO India and would be claimed as real cash put up to the project even though is joint activity.

*Sukanta:* what it means from the In kind support from the India side for equipment? What is it categorize as in kind in that sense? What can be done and what can't be?

*Anil:* Consumables from other projects might be able to be done. There is no cash that is available on the Indian side.

*Giles:* I think that is consistent with out side of the grant. Discussions we had previously with others. For example, we want to set up a table where we out some suspended optics. Then the question is, some of that can come from the Newton Bhabha, and I thought (speaking to others) then some of the mirror blanks would for example be purchased from India but some might come from LIGO India and this would be as support for this project.

*Anil:* I don't think officially we can do this. Newton Bhabha funds are here before the LIGO India funds started coming. So it's difficult for the LIGO India to support Newton Bhabha. For example the optics could be bought by LIGO India.

*Giles:* I think there will be a way around this, is of course working how to add value to the infrastructure and such towards LIGO India.

*Anil:* We have some money from LIGO India. I think that is happening right now, so there isn't a real issue is more how do we satisfy the Newton Bhabha.

*Giles:* We have to report every quarter how much we are spending and in kind from India. We need to show match fund value from the India side.

*Sukanta:* They don't want the money that is allocated for the LIGO India project to be allocated for another project but for example the suspension table can be used for both projects.

*Giles:* Any updates on the 10m prototype? Where is that being funded from?

*Anil:* 10 m prototype is coming from a different pot, not the LIGO India.

*Giles:* We could do a lot to help develop the 10 m prototype and I think it would look great for this grant if at the end of the day we could say that we achieved a 10m prototype to path the way to LIGO India.

*Anil:* the 10m prototype has many constraints.

*Giles:* I understand whenever it comes to DA it becomes tricky. We need to ultimately add value to Indian activities for GW related. There might be other sides where we would like to develop in the longer term. I hear when you say that is hard to communicate with other departments but is essential in the longer term.

*Anil:* There is enough money coming in as far as the Newton Bhabha in kind.

*Giles:* Ongoing activities such as laser stabilization and Sheffield and its all going in the right direction, building capabilities for LIGO India. We also need the reports:

[https://gilsay.physics.gla.ac.uk/dokuwiki/doku.php?id=ligo\\_india:document](https://gilsay.physics.gla.ac.uk/dokuwiki/doku.php?id=ligo_india:document)

## 2. Update on ongoing projects/visit

*Stuart:* we have Satyaki, he just arrived last week and is currently learning about Q measurements and about the ion beam deposition.

*Borja:* The 4 interferometers that we were building for LIGO India, they are finished. However, we wanted to anodize to protect the table so they were sent to a company. We are currently waiting for that to be sent back and then we can assemble again. So it should be about another month and a half before we send to India. I was hoping we could send ourselves to India for the meeting in India.

*Sukanta:* That sounds great to me. I didn't have issues with transporting optics through so it should be without a problem.

*Giles:* Have you engaged with anyone in the Indian side Borja to see where to send these?

*Sukanta:* I need to get back to you and Borja.

*Borja:* At the moment we are more about building and we have until Feb to decide where to send them to.

*Giles:* How do we develop the resources in India, whether it is in school or Univ. Would it be useful to have some info on how to use them, some experiments?

*Borja:* There will be info with the interferometers how to use them.

*Giles:* It might be useful if we can work with Sukanta and think how we can work projects around them. Differences between schools and Universities, developing resources for that.

*Borja:* At the moment by Feb when they are deliver to India they will come with instruction in how to use them. That's already done. Anything else will need to arranged in the near future in how to further take this.

*Giles:* There is money to spend on this grant with follow up projects on the same link:

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Nils, any update on your side?

*Anil:* There is a window of opportunity as students will start applying for projects we could start thinking of LIGO specific projects. Undergrads looking for research areas who could get motivated from having LIGO focused projects.

*Nils:* Sukanta is in charge of the translation of the leaflets. I still need to send one document with the text. We have some character drawings, but we need the text so this is progressing we need the words and should be fast.

*Giles:* We also talked about explaining to the local community about LIGO India and what will be happening now. Is that a diff leaflet?

*Nils:* I believe is the same, Sukanta might take note of this. The first leaflet should be LIGO India specific the other text hasn't changed much. IT would be good to have more specific info for the local community. I think.

*Sukanta:* I agree with Nils, the leaflets that we already have. I think we should get the translations available this week. But we should have more specific wording. We need to speak about this.

*Giles:* Think big, if we need a follow up leaflet it can be done there's the money. Umakant, do you want to give an update on the Sheffield work.

*Umakant:* To update we decided the optical layout, we worked on the cavity design, got some drawing and wrote to some companies to get this. The cost of this cavities is very expensive, around 40k\$. We've been looking at other cheaper cavities. The only thing that is holding us is to find cheaper cavities and after that we would want to build this small scale interferometer with most elements for the real thing. In terms of students I've spoken to one of my PhD students so he can go to Sheffield but the laser hasn't arrived there so at the moment there's not date yet for the student visit on until the cavities are decided and the laser arrives.

*Giles:* We were hoping the laser would have arrived by now. Let's have a talk on the cavities as I think some of the others should also work.

*Umakant:* We need to wait on the laser to work out exactly what cavities are needed.

*Nils:* After the meeting we decided to make a number of people interested in numerical relativity, I have a list now of some Indians and it would be great to spread that out so we could get more names.

### 3. Discussion on workshop on data analysis/entrepreneurship to set up date.

*Giles:* Entrepreneurial workshop, at the UK meeting we spoke about having a couple of workshops in India so it could be Data analysis/numerical and one in Entrepreneurship and we were looking at possible dates. Sukanta we went to the end of January as a possibility. Do you have a better Idea now of dates?

*Sukanta:* I think we can find some dates in Jan/Feb although Dec is interesting for other reasons as there is a winter break here.

*Umakant:* Only problem is it overlaps with exams but other than that it should be OK in Jan.

*Sukanta:* what are the dates again?

*Umakant:* Dec 3<sup>rd</sup> to 6<sup>th</sup> are no, so anything else is fine I guess.

*Giles:* We will send a doodle poll around.

#### 4. Important dates for UK people to visit India and help on outreach related issues such as "Science day"

*Giles:* Understand from the Indian side, what are potential dates where u think it would be useful to have UK people in India, we talked about the workshops, the other one we know is Science day, are there any other dates were you think having UK people around would be useful?

*Anil:* we have a student festival in January and we could ask to have help for that festival.

*Giles:* We should make sure than when we have visits we make the most of it. We could provide talks, lecture activities and such. The important part is to know dates when things are happening.

*Umakant:* We would like to have a student in about 6 months after this lab starts staking shape so they could add some value between IUCAA and us.

*Stuart:* there is a bit of activity between the activities is for a new Q measurements, and in the US. So we should have a talk about setting up something similar in India. I am sure there will be a students we can arrange to have a visit.

*Giles:* Let us know when it would be useful to have people from the UK go to India.

#### 5. Updates on British trade Embassy and companies.

*Giles:* Any updates on the British trade embassy. We'll need the contacts for when we run the entrepreneurial workshop as it would be good to have contacts with companies in India.

#### 6. OAB

*Giles:* Two final thins then: **One:** remember we have money to spend, we are currently underspent. Partly because we've had other sources of income. Such as the 40k£ and some extra institution 40k£ spent. We have money to spent so think about moment that could be used. If you have any ideas, please fill in the applications so they can get reviewed. Only a year and a half left on grant.

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**Two: Next meeting 15<sup>th</sup> of October for the next call: 9am UK, 13:30 India.** So hopefully we can have an item then with reviews of application. So please remind your colleagues and we can remind everyone on this.