



Einstein-First

Every child has the right to share our best understanding of physical reality

Einsteinian Physics Education Research Collaboration (EPER)

ARC Centre of Excellence for Gravitational Wave Discovery, OzGrav

LIGO Scientific Collaboration Education and Public Outreach Working Group

19th March, 2020

Success of the Inaugural Einstein-First International workshop

We are delighted to tell you that the first Einstein-First project workshop with our international partners was a great success. Presenters from different countries shared their work and ideas on teaching Einsteinian physics in the classroom. All the presentations are available on the Einstein-First website. To view them please click [here](#)

Collaboration meeting at the inaugural workshop

At the inaugural workshop, Dr Elaine Horne kindly chaired a session to discuss the various possibilities of a collaboration and how we could benefit from each other's efforts. The outcome of this meeting can be found [here](#) under the title of 'Outcomes collaboration 2020 report'

Lesson plans for primary and secondary schools

Last year, we had a number of workshops with primary and secondary school teachers where we discussed various possibilities for integrating Einsteinian curriculum into the existing science curriculum. As per the teachers' suggestions, we are creating lesson plans which will be easy for teachers to follow and will build their confidence to teach these concepts. Once these lesson plans are ready, we will schedule another workshop with teachers to get their feedback on the said lesson plans.

Teachers' training

We are planning to train our partner teachers in teaching Einsteinian physics. The Schedule is pending as we are pondering whether to do it through Zoom, in person at UWA or where possible at schools. Which would you prefer? Also, please suggest the best time for you to undergo training. Any other ideas or suggestions are also welcome.

Updates on the schools' engagement

Last year, we received expressions of interest from various schools to participate in this project which will help our team to conduct programs on location and provide training to their teachers. We are sending letters to each school's principal and their corresponding teachers to ensure that they are still willing to be a part of this project. The school principals are asked to reply. If you or your school have not received such an email can you please email me as soon as possible. If you have received it and have not yet replied, then please do so as soon as possible. These responses will help us to plan our future trial programs in schools.

‘Teaching Einsteinian Physics’ book project

As mentioned in our last newsletter, the Einstein-First team and their international collaborators are working on a book project called “Teaching Einsteinian Physics” which will be published by well-known publisher ALLEN & UNWIN. The book is progressing very well and we anticipate that it will be ready to publish in 2021.

Research activities

We have many exciting research results that have been submitted to reputable journals; others are still in progress. Here are some highlights:

- A paper based on the gender-related results from all the interventions has been accepted for the publication by the journal “Physics Education”. You will find it on our website once it is published.
- A paper based on our trial collaborative program on the integration of three resources developed independently by the EPER collaboration has been published by the journal “The Physics Educator”. To read this paper, please click [here](#)
- A paper describing the program we ran with Mel Maria Catholic Primary School Year 3 students, that showcased the enthusiasm of the children who learned about photons and gravity, is in progress.
- A paper based on a new approach for teaching quantum path integral to high school students is in preparation.
- A paper based on students’ retention/ views 8 years after participating in the program is in preparation

Special lessons on ‘Black holes’

Massimo Mckie has finished his summer internship in this project. During his internship, he developed a program on black holes and ran it with high school students. We were aware that students have a great curiosity to know about black holes. The research results obtained from this program proved it once again. The program was featured on the 11 March *Inside Cover* piece in The West Australian. More details about this program will be available in the next newsletter.

Jyoti Kaur is back

Jyoti Kaur who delivered a healthy baby boy in December has just returned from her maternity leave. From now onward, for any queries, please feel free to contact her at tejinder.kaur@uwa.edu.au.

Many thanks to Carolyn Maxwell who co-ordinated the project perfectly in the absence of Jyoti. She is now ready to start and focus on her PhD. All the best Carolyn!

Einstein-First logo

Many thanks to our OzGrav education staff Carl Knox and Mark Myers from Swinburne university who created a beautiful logo for the Einstein-First team. In case you missed it, please scroll up to look at our new logo.

Coronavirus outbreak

As the global Coronavirus (COVID – 19) outbreak continues to evolve, the safety of our group members, teachers and students is our priority. At the moment, we are not running any programs either with the students or the teachers here at UWA. Please take care and look after yourself.

Interested in joining the project?

If you are interested in running Einstein-First programs in your classrooms and have not sent us an expression of interest, please feel free to contact us.

The Einstein-First team is looking for PhD and Master students. We have received an expression of interest from four teachers who want to contribute in this research by joining either as a Masters or PhD student. We are still looking for more. If you are interested to join you still have the opportunity. Please feel free to contact us. If you know of any others who might be interested, please pass on our details.