

JENNIFER2 Summer Schools

Abi Soffer

Tel Aviv University

For the summer school committee:

Zdenek Dolezal

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Antonio Passeri

Federico Sanchez

Shoji Uno

JENNIFER2 general meeting
Nov 2022, Prague



**2nd JENNIFER2 SUMMER SCHOOL
ON PARTICLE PHYSICS AND DETECTORS**
19 - 27 July 2021 virtual attendance

SCIENTIFIC PROGRAM
Heavy flavour and neutrino physics
Accelerator and detector physics
Statistics and machine learning
Hands-on sessions and virtual tours
Optional follow-up mentorship

Organizing committee
Z. Dolezal (Prague), T. Kobayashi (KEK), T. Matsubara (KEK),
R. Ota (KEK), A. Passeri (INFN), K. Sakashita (KEK),
F. Sanchez (Geneva), A. Soffer (Tel Aviv), S. Uno (KEK)

Students from any country with 3 – 4.5 years of university physics education are invited to apply at <https://indico.belle2.org/event/4071/>
Application deadline: 31 May 2021
Contact: jennifer2-school@ml.post.kek.jp

G.A. 822070

Original plan for J2SS 2020 at KEK

- 15 European (62 eligible applications), 5 Japanese (1 applicant) students
- All expenses paid (almost €30k)

	Mon 6	Tue 7	Wed 8	Thu 9	Fri 10	Sat 11	Sun 12	Mon 13	Tue 14	Wed 15
8:30-10:00	Theory	Theory	Theory	Theory	Tokai	Nikko etc.	Free	Nu exp.	Hands-on	Flight 10:20
10:30-12:00	Det.	Det.	Nu exp.	Nu exp.				HF exp.	Hands-on	
1:00-2:30	Stat.	Stat.	HF exp.	HF exp.				Hands-on	Student reports	
3:00-4:30	Hands-on	Hands-on	Hands-on	Hands-on				Light source	ILC	
5:00-6:30 or after dinner	Student posters, reception	KEK intro	B factory	Famous physicist				Science communication	Student reports, feedback, summary	

Physics lecture: 14 blocks

Hands-on: 7 blocks

Tour

- Yuval Grossman: Theory 4 blocks
- Francesco Forti: Detectors 2 blocks
- Asher Kaboth: Statistics 2 blocks
- Teppei Katori: Neutrino experiment 3 blocks
- Karim Trabelsi: HF experiment 3 blocks

Virtual school agenda

<https://indico.belle2.org/event/1045>

- Considered online lectures more tiring
- So decided to shorten the agenda from 14 lecture blocks to 8, but keep all the topics
- All the speakers graciously agreed
- Added an hour each day for spillover and discussion as needed – eventually used on all days
- Determined that the Belle II masterclass could be done online
- Converted physical KEK tours to virtual tours
- Moved dates to end of July to avoid exam overlap
 - Exam date uncertainties well into June)

	M	T
Time (CEST)	20-Jul	21-Jul
9:45-10:00	Welcome	
10:00-12:00	Forti	Kaboth
14:00-16:00	Grossman	Grossman
16:00-17:00	Discussion	Discussion
	W	T
	22-Jul	23-Jul
10:00-12:00	Trabelsi	Trabelsi
13:00-15:00	Katori	Katori
15:00-16:00	Discussion	Discussion
	F	M
	24-Jul	27-Jul
9:30-12:00	Masterclass	Virtual tours

Actual participation

- Screenshot from end of first day – very representative of the level of participation throughout the school



- This was the most amazing thing about the virtual school: 47-51 attentive faces constantly present and listening.
- There were questions, but most students were shy, as in a colloquium.
- On Thursday we had the idea of having lunch together in breakout rooms
 - Very successful in encouraging discussion and familiarity.
 - **Most important lesson for future**

Student statistics

1. Australia
2. Bosnia (I don't remember if attended eventually, work/exam conflict)
3. Czechia
4. France (1 student, originally from Greece)
5. Germany
6. Greece
7. India
8. Israel
9. Italy
10. Japan
11. Korea
12. Poland
13. Russia (1 student, originally from Zambia)
14. Slovenia
15. Spain (3 students, 1 originally from Pakistan)
16. Sweden
17. Switzerland
18. Turkey
19. UK
20. Ukraine

Education:

- Mostly last-year undergraduates
- Large portion of 1st-year masters

Online Belle II masterclass

- 36 students expressed interest
 - Several more asked to join at the last minute.
 - I agreed, but somewhat discouraged that, fearing too-large groups, but not a problem eventually
- 6 volunteers: Marko Bračko, Alberto Martini, Daniel Červenkov, Radek Žlebčík, Jakub Kandra, Ezio Torassa
 - Planned on 5 groups with Ezio leading the effort
 - Eventually Radek was disconnected, so Ezio stepped in as a group guide.
- Some got disconnected and I reconnected them to their zoom room.
- ~3-4 dropped out and didn't rejoin (too many for just connection problems)
- All using the new Ljubljana server: no problems.

Virtual KEK tours

- Tsukuba:
 - Shoji Uno led a tour of Belle II and SuperKEKB
- J-PARC:
 - Takashi Kobayashi led the tour with Ken Sakashita, Tsunayuki Matsubara, Takeshi Komatsubara reporting from the T2K ND, KOTO
- Tried to combine relatively well edited pre-shot video (higher quality) with live video (sense of being there)
- Sorry, I was paying close attention and forgot to take screenshots...

Student satisfaction survey

- Filled by 24 students (~50%) + 4 applicants who eventually didn't attend
 - How did you hear about the school?
 - What were your expectations from the school?
 - Relative to the option of holding the school at KEK, what are the most important disadvantages of having it online, in your experience?
 - Do you see some advantages in holding the school online? What are they? How important are they relative to the disadvantages?
 - To what extent do you feel that your goals for the school have been reached, given the limitation that it was held online?
 - To what extent has the school attracted you to working on heavy flavor or neutrino physics for your MSc or PhD research? Have you had prior research experience in this area?
 - Please provide any other criticisms or comments. In particular, what do you suggest we improve or change if the school is held online in the future?
 - +16 specific questions on different aspects of the school

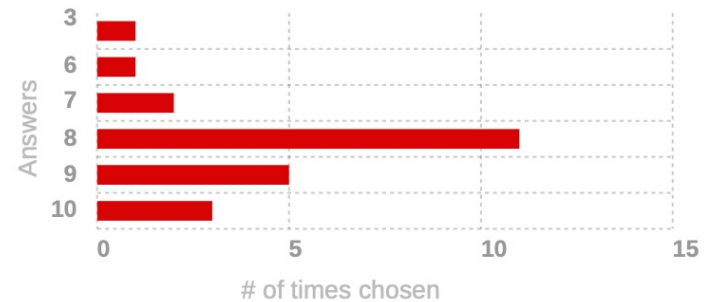
To what extent do you feel that your goals for the school have been reached, given the limitation that it was held online?

Answered: 23

Average: 8.09

Min: 3

Max: 10



Why? Comments:

Answered: 22

I got insight in some particle physics but I lacked (obviously) the experimental side

I think that I learned a lot even if the lessons were not in presence

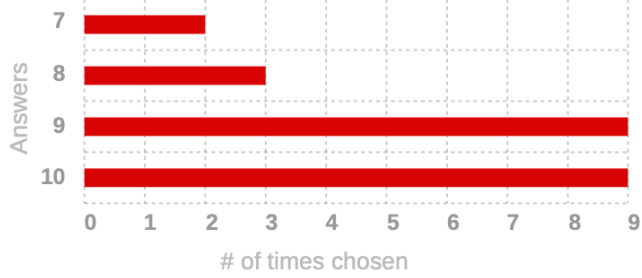
Lectures were a little higher level than I'd hoped assuming significant prior knowledge. Content was still informative and enjoyable however.

I have a first contact with some topics and It opens my mind in a lot of ways

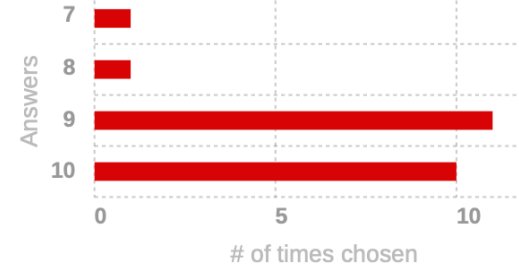
The school succeeded in giving good lessons with great teachers, so I learned a lot

I think we had no sufficient time to enter in the details of the topics we have seen. Also, being held online, I didn't have the time and the faculty to get fully immersed in the lessons and in the summer school spirit. Also, even if the lunches together and the facebook group were great, there has been a lack of communication between students that it is the key to comprehend the lessons and share fruitful opinions.

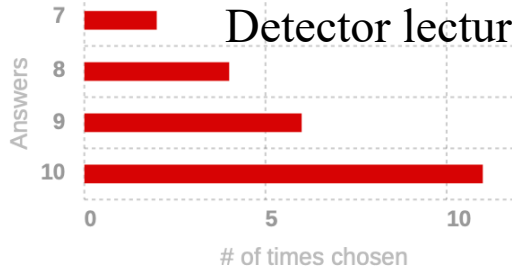
Choice and balance of topics



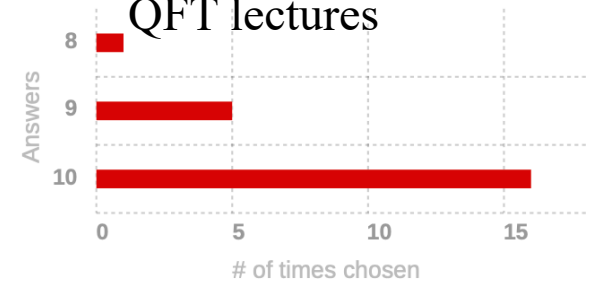
Lecture schedule



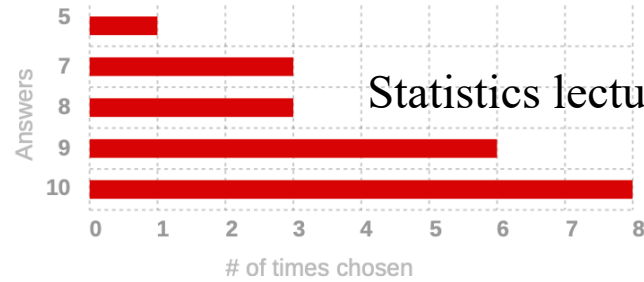
Detector lectures



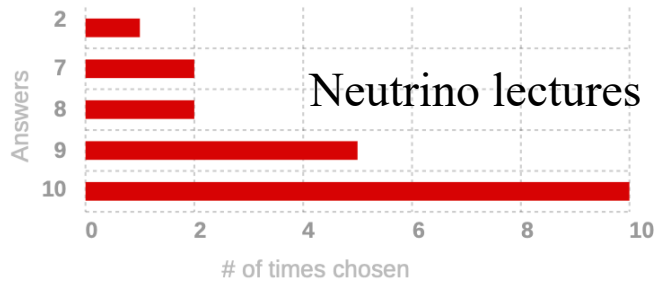
QFT lectures



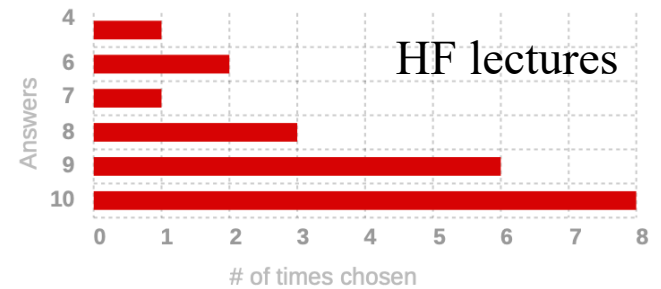
Statistics lecture



Neutrino lectures



HF lectures



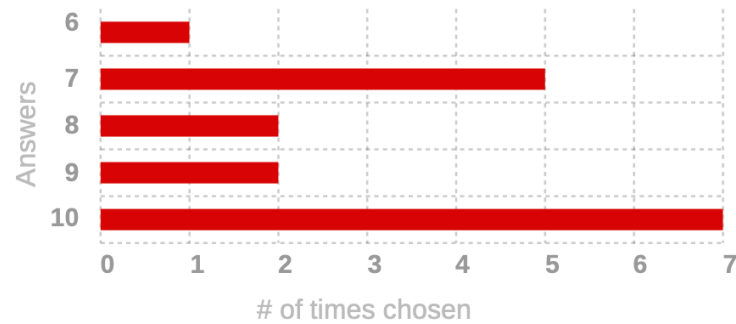
How satisfied were you with the Belle II masterclass?

Answered: 17

Average: 8.53

Min: 6

Max: 10



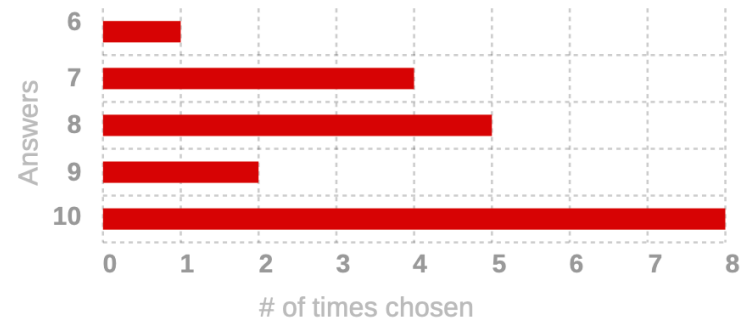
How satisfied were you with the virtual tours?

Answered: 20

Average: 8.60

Min: 6

Max: 10



2020 Mentorship program

- We got 17 volunteer mentors who worked with school students (27, I think) on a project after the school, usually remotely.
- All parameters (scope, length, expectations, etc.) defined together by the mentor and the mentee

Thomas Kuhr
Andrzej Bozek
Francesco Terranova,
Andrea Longhin
Agnese Giaz
Stefano Lacaprara
Francesco Forti et al
Giacomo Da Pietro
Philip Bambade
Marco Bracko
Claudio Giganti
Sara Bolognesi
Federico Sanchez
Mehmet Zeyrek & Selcuk Bilmis
Peter Lewis
Diego Tonelli
Paolo Branchini

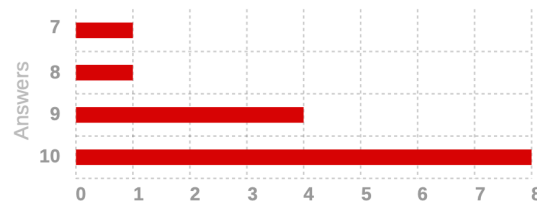
To what extent were your expectations met?

Answered: 14

Average: 9.36

Min: 7

Max: 10



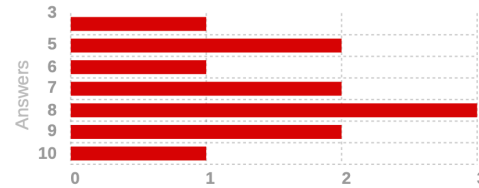
To what extent did you feel that you performed "useful" work that could advance the mentor's research?

Answered: 12

Average: 7.08

Min: 3

Max: 10



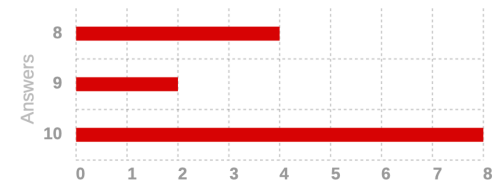
To what extent did you feel that the mentorship was useful for you? How much did you learn from it?

Answered: 14

Average: 9.29

Min: 8

Max: 10



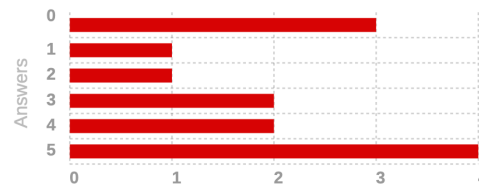
To what extent has the mentorship changed your interest in graduate studies in particle physics?

Answered: 13

Average: 2.85

Min: 0

Max: 5



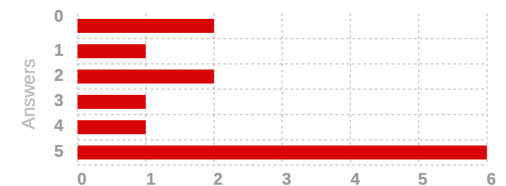
To what extent has the mentorship changed your interest in graduate studies in heavy flavor physics or neutrino physics?

Answered: 13

Average: 3.23

Min: 0

Max: 5




2021 school

- Same format, expanded, bolder program:

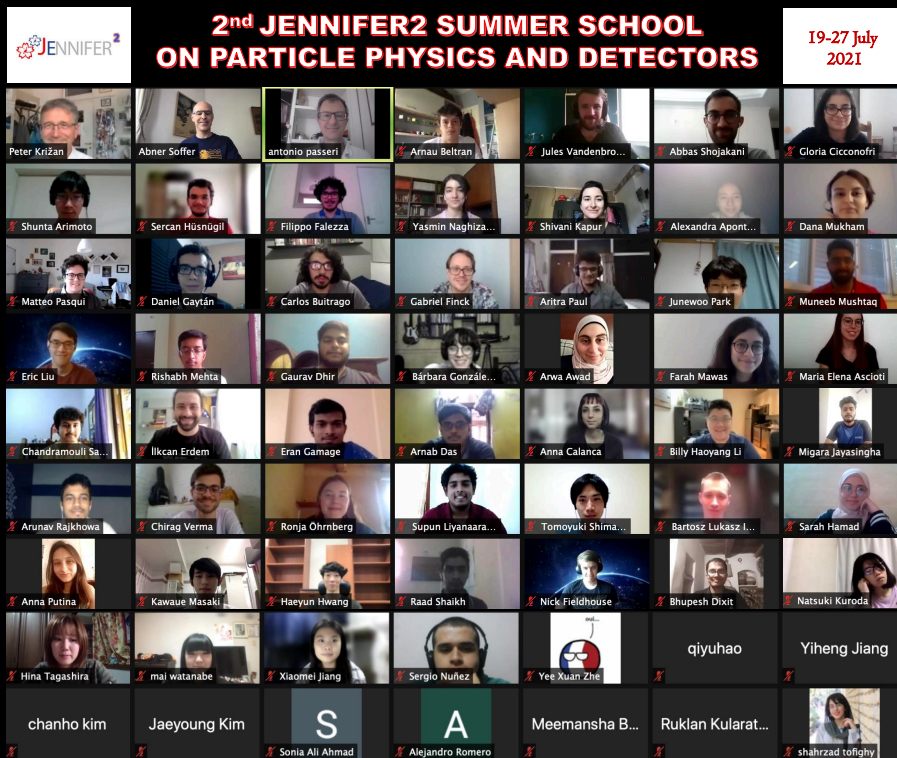
		19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
CEST	JST	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue
8:30	15:30	Flavor theory, Pich	Flavor theory, Pich	Flavor theory, Pich	Heavy quark physics, Tonelli	Drift chamber construction & analysis	Virtual tours		Machine learning, Vallecorsa	Belle II analysis masterclass
10:00	17:00	Break	Break		Break				Break	
10:30	17:30	Accelerator physics, Masuzawa	Detector physics, Krizan	Statistics, Bolognesi	Neutrino physics, Blondel				Tau, Rostomyan	
12:00	19:00	Lunch/Dinner	Lunch/Dinner	Lunch/Dinner	Lunch/Dinner				Lunch/Dinner	
13:00	20:00	Detector physics, Krizan	Statistics, Bolognesi	Heavy quark physics, Tonelli	Neutrino physics, Blondel	Machine learning, Vallecorsa			New physics searches, Ferber	Discussion

- The organizing committee
 - Zdenek Dolezal, Tsunayuki Matsubara, Ritsuko Ota, Antonio Passeri, Kan Sakashita, Federico Sanchez, Abi Soffer, Shoji Uno
- Our lecturers
 - Antonio Pich, Mika Masuzawa, Peter Krizan, Sara Bolognesi, Diego Tonelli, Alain Blondel, Sofia Vallecorsa, Armine Rostomyan, Torben Ferber
- Our masterclass tutors and organizers
 - Antonio Passeri, Alberto Martini, Giacomo De Pietro, Radek Žlebčik, Tadeas Bilka, Karol Adamczyk, Jarek Wiechczynski (and more TBC)
- Our virtual tour and drift chamber guides
 - Katsuro Nakamura, Shoji Uno, Ken Sakashita, Tsunayuki Matsubara, Takeshi Komatsubara, Guillaume Pronost

Students

- About 150 applicants
- 87 admitted: 
- Most of those rejected didn't meet the criteria based on years in physics studies etc.
- In 2 cases rejected lowest ranked in country:
 - Had 33 applicants from India, 8 from Sri Lanka

- 1 Colombia
- 2 Ecuador
- 1 Honduras
- 3 Mexico
- 2 Peru
- 3 United States
- 1 Austria
- 1 Belgium
- 1 Czechia
- 1 Finland
- 1 France
- 1 Hungary
- 7 Italy
- 9 Japan
- 1 Poland
- 2 Russian Federation
- 2 Spain
- 3 Turkey
- 7 United Kingdom
- 14 India
- 3 China
- 2 Iran
- 4 S. Korea
- 4 Lebanon
- 1 Malaysia
- 1 Pakistan
- 2 Philippines
- 5 Sri Lanka



Mentorship

- 40 students
- 23 mentors:

Antonio Passeri
Emi Kou
Giulia Casarosa
Evgueni Goudzovski
Sofia Vallecorsa
Mehmet Zeyrek, Selcuk Bilmis
Claudia Cecchi, Elisa Manoni
Kendall Mahn
Leonidas Soplin
Jan Strube
Alakhaba Datta
Tom Browder
Jim Libby
Saurabh Sandilya
Gagan Mohanty
Matsubara-san
Seema Bahinipati, Vishal Bhardwaj
Thomas Kuhr
Toni Pich
Giulia Ricciardi
Philip Bambade
Paolo Branchini
Diego Tonelli
Jake Bennett

What about the future?

- There was much interest in the online schools and the mentorships
- Useful in countries that usually don't participate in HEP
- Significant outreach activity for students in the interface between BSc and graduate school

- For 2023, it's too late to organize a school at KEK, but can probably organize one in Europe
- For 2024: at KEK again?...