

Japan and Europe Network for Neutrino and Intensity Frontier Experimental Research



18 months after J2GM in Prague:

General Meeting



Unravelling the mysteries of
matter, life and the universe.

KEK, Tsukuba, june 2nd 2024

**A really big THANK YOU to KEK colleagues for
organizing this meeting on Sunday!**

Takeshi Nakadaira, Takashi Kobayashi, Mikihiko Nakao, Yutaka Ushiroda

Really special thanks to:

Ritsuko Ota (now at Tokyo University)



It's great to meet in Japan !

thanks to the coincidence of Belle II and HyperK meetings during the same week

However:


Matching talks in person and remote, people already at KEK and people just arriving, and fitting all in the same day, made the agenda a nightmare.

Please be patient and flexible. Most WPs are split into 2 parts. Talks are quite brief.

Let's exploit this time together to understand how we are performing and where to act for the last year of the project.

Remind our mission:

*“ The JENNIFER2 project aims to produce **synergy and knowledge sharing** among experimental particle physics groups searching for signal of new physics in neutrino and flavour physics, exploiting the discovery potentialities of experimental facilities located in Japan. “*



Europe ↔ Japan
Neutrino ↔ Flavour
Academy ↔ Industry
Research ↔ Society

Marie Slodowska Curie – Research and Innovation Staff Exchange



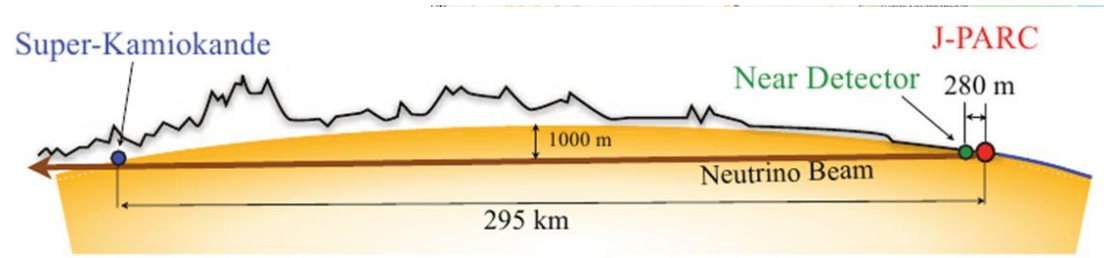
Who we are: from Europe.....



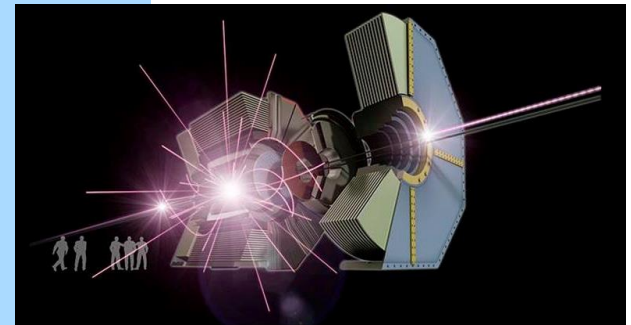
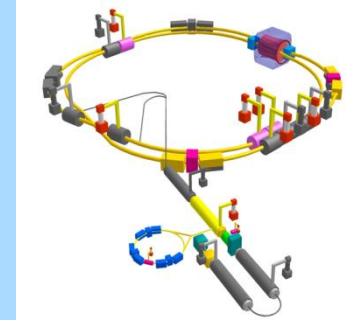
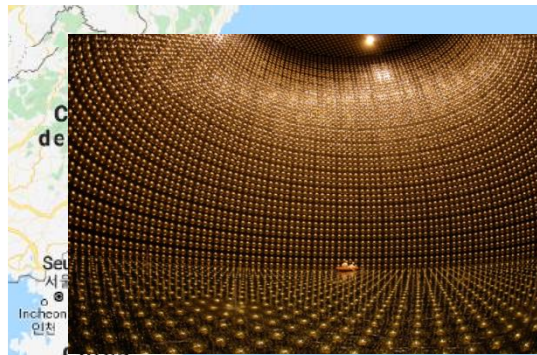
INFN
DESY
OAW-HEPHY
JSI Ljubliana
IFJ-PAN
NCBJ
UKP Prague
CNRS

Université de Genève
IFAE
King's College
UKRI - RAL
Tel Aviv University
METU Ankara
CAEN
Fondazione Bruno Kessler

....to Japan



Unravelling the mysteries of matter, life and the universe.



JENNIFER²
EU grant n.822070



JENNIFER2 structure

Person months:

WP1: Belle II data analysis. **220**

WP2: T2K upgrade and data analysis. **138**

WP3: Towards HyperK. **85**

WP4: Photodetectors R&D. **34**

WP5: Computing and common techniques. **56**

WP6: Communication and outreach **0**

WP7: Management **0**

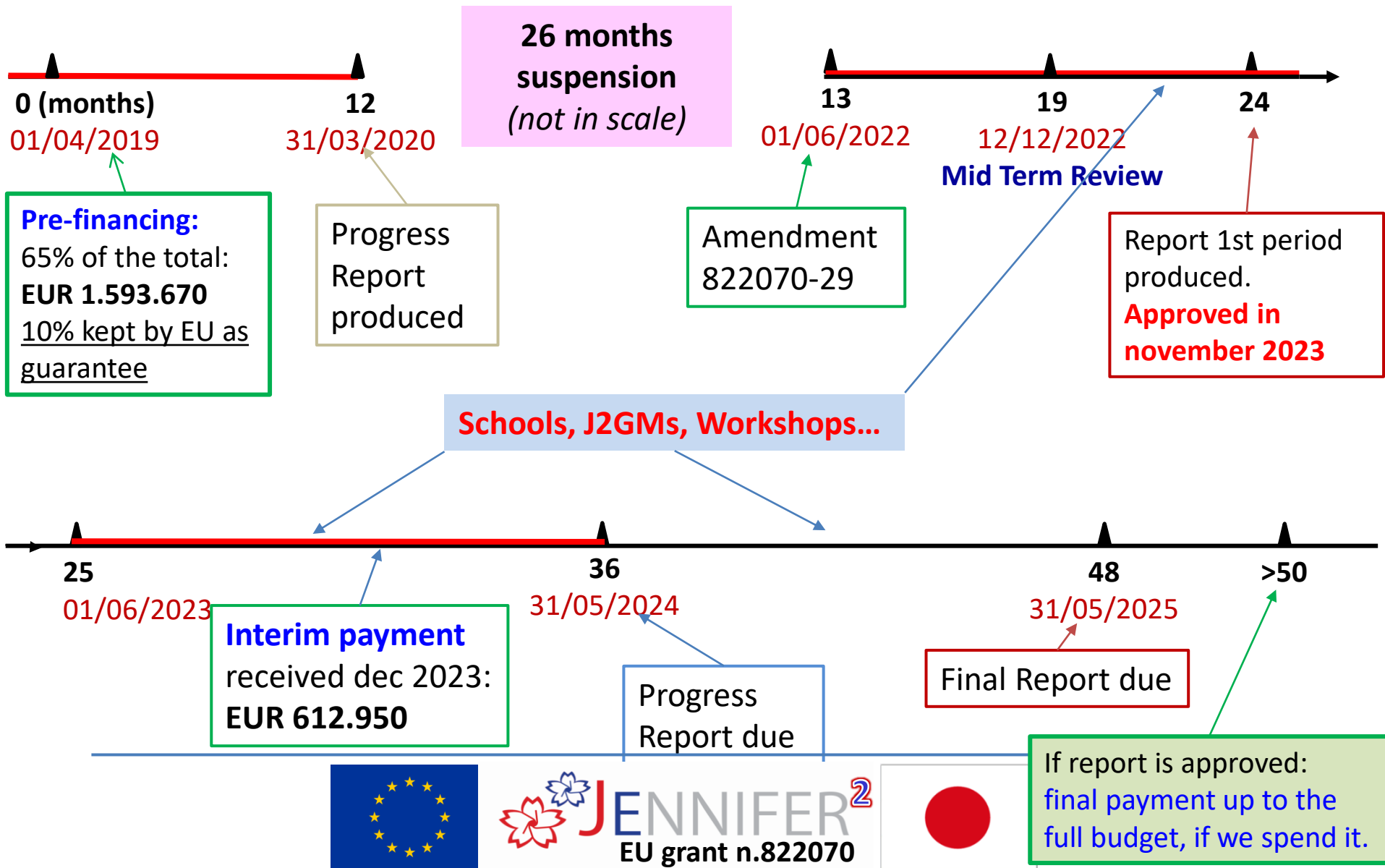
Total: 533 p.m.



JENNIFER2 Budget

| Beneficiary | grant amount from GA | number of person months |
|--------------------|-----------------------------|--------------------------------|
| INFN | € 731.400,00 | 159 |
| DESY | € 372.600,00 | 81 |
| OEAW | € 101.200,00 | 22 |
| JSI | € 128.800,00 | 28 |
| CNRS | € 184.000,00 | 40 |
| CEA | € 96.600,00 | 21 |
| QMUL | € 207.000,00 | 45 |
| UKRI | € 151.800,00 | 33 |
| UKP | € 41.400,00 | 9 |
| IFJ PAN | € 82.800,00 | 18 |
| NCBJ | € 115.000,00 | 25 |
| TAU | € 27.600,00 | 6 |
| METU | € 27.600,00 | 6 |
| UNIGE | € 110.400,00 | 24 |
| IFAE | € 55.200,00 | 12 |
| FBK | € 4.600,00 | 1 |
| CAEN | € 13.800,00 | 3 |
| | | |
| Total | € 2.451.800,00 | € 533,00 |

JENNIFER2 timeline



Next Steps

Budget: summing pre-financing and interim payment we already got 90% of the project budget. Still the final 10% we can get by implementing the whole planned secondments.

Report month 36: it's a light report but should spot possible problems and describe countermeasures

Secondment Planning: check that all secondees reach at least 30 days. Consider quickly re-distribution of unusable secondments among beneficiaries.



Review of JENNIFER2 tasks and deliverables



Task 1.1: Detector performance

Task 1.2: CP violation

Task 1.3: LFV

Task 1.4: Dark sector

Task 1.5: Quarkonium

All tasks are covered in Belle II. Available data sample allows to perform some measurement in all tasks.

Hardware activity for LS1 has been included during the Mid-term Review

There is plenty of choice between Belle II papers to meet the physics deliverables, a performance paper is also needed.



WP1

Milestones: all at month24 -> may 2023

| | | | | | |
|-----|--|---|-------|----|-------------|
| 1.1 | Report on detector performance | 1 | INFN | 24 | Document |
| 1.2 | Conference Presentation on CPV | 1 | HEPHY | 24 | PublicTalk |
| 1.3 | Conference Presentation on LFV and LFUV search | 1 | DESY | 24 | PublicTalk |
| 1.4 | Conference Presentation on dark sector search | 1 | HEPHY | 24 | Public Talk |
| 1.5 | Conference Presentation on Spectroscopy | 1 | JSI | 24 | Public Talk |

Deliverables: all at month 48 -> may 2025

| | | | | | |
|------|-------------------------------------|----------|--------|--------|----|
| D1.1 | Publication on detector Performance | 1 - INFN | Report | Public | 48 |
| D1.2 | Publication on CPV | 3 - OEAW | Report | Public | 48 |
| D1.3 | Publication on LFV and LFUV | 2 - DESY | Report | Public | 48 |
| D1.4 | Publication on dark sector | 3 - OEAW | Report | Public | 48 |
| D1.5 | Publication on Spectroscopy | 4 - JSI | Report | Public | 48 |

Work Package 2 (E.Radicioni)

T2K

Task 2.1: Construction and Commissioning of Near Detector ND280

Task 2.2: Construction and Commissioning of Super FGD

Task 2.3: Neutrino cross section measurement

Task 2.4: Oscillation analysis

Deliverables: all expected in may 2025

| | | | | | |
|------|---|-----------|--------|--------|----|
| D2.1 | Paper on the upgraded ND280 | 1 - INFN | Report | Public | 48 |
| D2.2 | Report on neutrino cross section on Carbon and Oxygen | 15 - IFAE | Report | Public | 48 |
| D2.3 | Report on electron neutrino cross section | 1 - INFN | Report | Public | 48 |
| D2.4 | Report on CP violation phase sensitivity | 5 - CNRS | Report | Public | 48 |



WP2 milestones:

WP2 Milestones

| | | | | | |
|-----|---|--------------------------------|------|----|-----------------|
| 2.1 | Production and test of ND280 prototypes | ² REACHED | INFN | 24 | Prototype |
| 2.2 | Improved acceptance for cross section | ² REACHED | IFAE | 24 | Internal Report |
| 2.3 | Off axis neutrino energy reconstruction | 2 | INFN | 36 | Internal Report |
| 2.4 | Inclusion of multi-ring topologies | ² REACHED | CNRS | 24 | Internal Report |

may 2024



Task 3.1: Gadolinium doped WC study

Task 3.2: WC calibration system

Task 3.3: HK outer detector design

Task 3.4: Low noise FE for large area PMTs

Task 3.5: HK simulation

Tasks 1,2,3,5 more or less evolving as declared in the proposal.

Substantial reshaping of task 3.4 agreed one year ago in Periodic Report 1:

design and test the underwater services (the data processing module and LV and HV supply units) is now also part of the task. Milestone and deliverable re-defined accordingly



WP3 deliverables

We missed month 30 deadline: we should fix the holes in time for month 36 progress report !

Deliverables

november 2023

may 2024

| | | | | | |
|------|--|---------------------------------|--------|--|----|
| D3.1 | Decision on UV system to measure Gd concentration | 8 - UKRI | Report | Confidential, only for members of the consortium (including the Commission Services) | 30 |
| D3.2 | Technical note on Outer Detector | 7 - QMUL KCL | Report | Public | 36 |
| D3.3 | Final report on low noise front end electronics and underwater electronics | 14 - UNIGE INFN-NCBJ | Report | Public | 48 |
| D3.4 | Full simulation and analysis with final photosensors | 7 - QMUL KCL | Report | Confidential, only for members of the consortium (including the Commission Services) | 48 |

Only one milestone for WP3

| | | | | | |
|-----|--|---|--------------------------|----|-----------------|
| 3.1 | Report on waveform digitizers and underwater electronics | 3 | UGE INFN-NCBJ | 30 | Internal Report |
|-----|--|---|--------------------------|----|-----------------|



Task 4.1: SiPM in neutron irradiated areas (R.Pestotnik) + FBK

Task 4.2: Long lived MicroChannelPlate PMTs (E.Torassa)

Task 4.3: Multi PMTs for large WC detector (E.Berardi, HyperK)

Task 4.4: Organic photosensors R&D (A.Aloisio, P.Branchini)

Each task is strongly supported by very motivated groups.



WP4 deadlines

Deliverables

| | | | | | | |
|------|--|----------|--------------|--|-------------------|----|
| D4.1 | Training pn photodetectors at NDIP | 4 - JSI | Other | Public | DONE | 18 |
| D4.2 | Report on MCP-PMT lifetime optimization | 1 - INFN | Report | Public | DONE | 24 |
| D4.3 | Realization of a mPMT prototype module | 1 - INFN | Demonstrator | Public | DONE | 24 |
| D4.4 | Report on SIPM prototype tests as single photon counters | 4 - JSI | Report | Public | april 2024 | 35 |
| D4.5 | Resport on organic photodetectors | 1 - INFN | Report | Confidential, only for members of the consortium (including the Commission Services) | | 48 |

Milestones

| | | | | | |
|-----|--|---|------|----|-----------------|
| 4.1 | Report on acrylic vessel | 4 | INFN | 12 | Internal Report |
| 4.2 | Photo-transistor electrical characterization | 4 | INFN | 24 | Internal Report |



Each task has 2 convenors: one from Belle II and one from the neutrino community

Task 5.1: Common Computing and data handling (S.Pardi, S. King)

Task 5.2: Common DAQ and remote controls issues (S.Lange, B.Richards)

Task 5.3: Statistical methods for analysis combination (D.Tonelli, S.Bolognesi)

Task 5.4: Generators and phenomenology (E.Kou, G.Ricciardi)

A lot of work has been done in each task, strong coordination between Belle II and neutrino groups exist mainly in task 1 (2 joint workshop organized). For the other tasks efforts have been done and still have to be done to share ideas and activities.

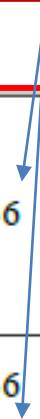


WP5 deadlines

may 2024

Deliverables

| | | | | | | |
|------|--|---------------------|----------|-----------------------------|--|----|
| D5.1 | Common Cloud Computing demonstrator | 2 - DESY | INFN-KCL | Demonstrator DONE | Confidential, only for members of the consortium (including the Commission Services) | 36 |
| D5.2 | Joint workshop on real time techniques | 7 - QMUL | DESY | Other DONE | Public | 36 |
| D5.3 | Reference Statistical Report | 6 - CEA | | Report | Public | 36 |
| D5.4 | Common Physics Workshop | 5 - CNRS | | Other | Public | 48 |



to be discussed

| | | | | | | |
|-----|---|--|---------------------|------|----|-----------|
| 5.1 | Flavour and neutrino internal physics workshops | | 5 REACHED | CNRS | 36 | Workshops |
|-----|---|--|---------------------|------|----|-----------|



Task 6.1: Masterclasses both flavour and neutrino physics

Task 6.2: Summer students at KEK

Task 6.3: Coordination of outreach to general public

Task 6.4: PhD co-supervision

- Belle II masterclasses very strong. Still looking for a first neutrino masterclass test.
- Summer school, after 2 virtual editions, turned into collaboration with KEKSSP.
- Only few cases of PhD co-supervision. Long stays of students in Japan implemented: reference japanese scientists can be quoted even if they are not co-supervisors.
- Task 3 very weak. Will try to address it in the project website redesign.



WP6 deadlines

Deliverables

| | | | | | |
|------|--|--------------------------------|---------------------------------------|--------|----|
| D6.1 | T2K Masterclasses | 1 - INFN | Other | Public | 48 |
| D6.2 | Summer School | 12 - TAU DONE (virtual) | Other | Public | 24 |
| D6.3 | Outreach Portal Delayed: found new web provider | 1 - INFN | Websites, patents filling, etc. | Public | 24 |
| D6.4 | PhD students co-supervision | 5 - CNRS | Other | Public | 48 |



Status of secondments

| Istitution | Days total | months planned | fraction done | missing days | |
|------------|------------|----------------|---------------|--------------|------|
| INFN | 3606 | 120,2 | 159 | 75,6% | 1164 |
| DESY | 2127 | 70,9 | 81 | 87,5% | 303 |
| OEAW-HEPHY | 676 | 22,5 | 22 | 102,4% | -16 |
| IFJ-PAN | 249 | 8,3 | 18 | 46,1% | 291 |
| UKP | 55 | 1,8 | 9 | 20,4% | 215 |
| JSI | 608 | 20,3 | 28 | 72,4% | 232 |
| METU | 22 | 0,7 | 6 | 12,2% | 158 |
| TAU | 65 | 2,2 | 6 | 36,1% | 115 |
| LAL-CNRS | 981 | 32,7 | 40 | 81,8% | 219 |
| CEA | 477 | 15,9 | 21 | 75,7% | 153 |
| IFAE | 360 | 12,0 | 12 | 100,0% | 0 |
| UNIGE | 356 | 11,9 | 24 | 49,4% | 364 |
| NCBJ | 507 | 16,9 | 25 | 67,6% | 243 |
| KCL | 145 | 4,8 | 45 | 10,7% | 1205 |
| UKRI | 150 | 5,0 | 33 | 15,2% | 840 |
| CAEN | 7 | 0,2 | 3 | 7,8% | 83 |
| FBK | 0 | 0 | 1 | 0 | 30 |
| Total | 10391 | 346,4 | 533,0 | 65,0% | 5599 |

according to original UK budget share. New distribution of budget and associated univ is being implemented

We are under-performing !!! We expect 75% at the end of third year !



secondments per WP:

| WP | Days total | months | planned | fraction done |
|--------------------|--------------|--------------|--------------|---------------|
| WP1 | 5705 | 190,2 | 221 | 86,0% |
| WP2 | 2764 | 92,1 | 139 | 66,3% |
| WP3 | 803 | 26,8 | 85 | 31,5% |
| WP4 | 400 | 13,3 | 32 | 41,7% |
| WP5 | 719 | 24,0 | 56 | 42,8% |
| | | | | |
| Grand Total | 10391 | 346,4 | 533,0 | 65,0% |

WP4 and WP5 have smaller budget, but clearly we have to push on WP3 secondments. Also WP2 have to keep a high rate!

Specific beneficiaries have also to push to spend quickly their budget: long stays of young reserachers?

NOW is the time to evaluate how much realistically can be implemented in each beneficiary and REDISTRIBUTE the quota that cannot be used.

Later will be more difficult.....



Please remind

Secondment management

JENNIFER2 has a well established secondments accounting procedure. Building blocks are:

- Communicate secondment dates prior to travel to jennifer2-secretariat
- Collect secondment declaration in host institutions secretariats
- Write and sign a very basic report of your secondment (or groups of secondments)

Note: in JENNIFER2 you can sum up in the same secondment different WPs (but not secondments to a different partner organization)

Essential EU rules for a valid secondment:

- The secondee must be a staff of the beneficiary (have a position) since at least 1 month before starting secondment
- The beneficiary must pay to secondee at least 2100 euros per secondment month from JENNIFER2 funds
- During secondment the secondee must work 100% for JENNIFER2 tasks.
- The secondment (adding all periods together for the same person) must last at least 30 days and not more than 12 months during the project life.



JENNIFER2 impact

- **Careers of young researchers and success stories**
We have many examples, will keep collecting them.
- **Dissemination of results to:**
 - Scientific community: publications
 - General society: outreach, schools, PhD opportunities
- **Added value for non-academic organizations,**
i.e. companies in the project (or around it)
 - CAEN is trying to compete at least 1 month.
 - FBK (not really non-academic) role has to be clarified.




JENNIFER2 Website


<http://www.jennifer2-project.eu/>

Getting old-fashion and not anymore maintained!
Found a new web provider, very interested also for following JENNIFER3 website.
Discussion is going on, hope to get an updated website for the fall

18/11/22, 08:52 Jennifer 2 Project – An MSCA-RISE project funded by European Union under grant n.822070



ABOUT WORK PACKAGES SECONDMENTS EVENTS OUT



Type Here to Search

Project news

T2K Results Restrict Possible Values of Neutrino CP Phase

Upcoming events

2nd JENNIFER2 General Meeting
November 17 @ 16:00 - November 18 @ 19:00

[View All Events](#)

Tweets from Consortium social feeds

MrFalken @MrFalken
3 Members

www.jennifer2-project.eu 1/2



Conclusions

JENNIFER2 activities are generally in good shape.

Milestones and deliverables are being produced and future ones seems reachable.

We are seriously underperforming with secondments implementation!

We have ONLYH ONE YEAR to spend the full project budget: please take care

