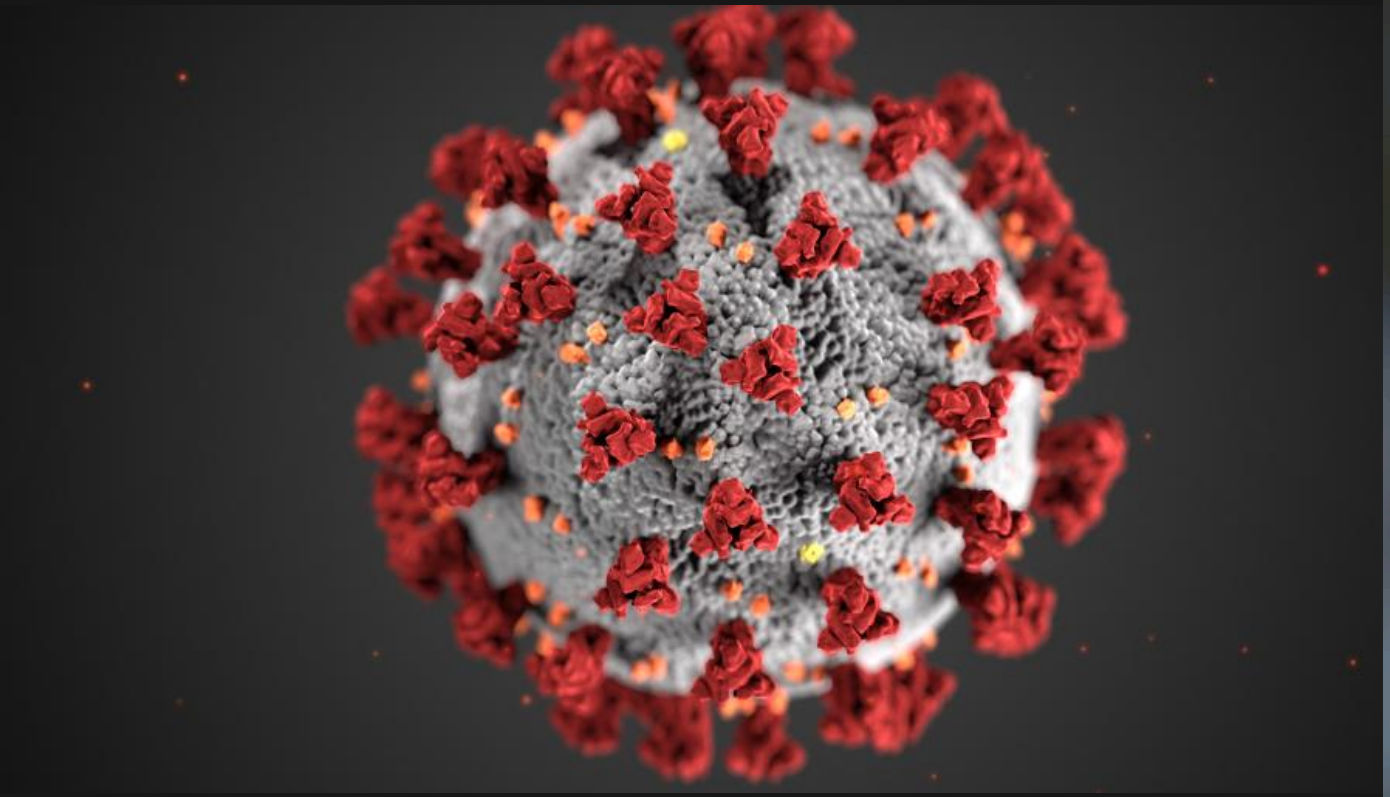
FIPs 2020 & COVID outbreak



What's the fate of FIPs 2020 ?

FIPs 2020

Workshop on
Feebly-Interacting
Particles

27 [illegible] CERN

Postponed to 2-4 September ?

FIPS at colliders (including
ATLAS, CMS, LHCb)

extracted beams /
fixed-target experiments

neutrino experiments

direct and indirect
dark matter detectors

axion/ALP experiments

and beyond

Organizers:

Martin Bauer
James Beacham
Albert De Roeck
Gian Francesco Giudice
Pilar Hernandez
Igor Irastorza
Joerg Jaeckel
Gordan Krnjaic
Gaia Lanfranchi
Jocelyn Monroe
Silvia Pascoli
Joshua Ruderman
Philip Schuster
Mikhail Shaposhnikov
Jessie Shelton

indico.cern.ch/e/FIPs_May_2020

Topics for discussion

- ✓ Scheduling FIPs 2020
- ✓ Format of FIPs Proceedings
- ✓ Information about related activities:
  - "PBC meets Theory" workshop
  - iDMEu Expression of Interest

Scheduling FIPs 2020: Three options:

1) Keep the workshop as scheduled but online-only:

- only afternoons [compliant with US PT];
- extend the workshop by two days to keep all the talks (31/8-4/9) (Monday-Friday)

pros: - (almost) all speakers and (almost) all organizers available;
- we can engage with snowmass process;

cons: - not in-person meeting…

2) Postpone by ~1 month (30/9-2/10), hoping that most of speakers/participants come in person:

- but enabling also online connection for those who cannot travel

pros: - most in-person meeting (I hope) and still in time to cope with snowmass

cons: - we do not know speakers/organizers' availability
- half in-person/half online perhaps is not optimal…

3) Postpone everything to spring 2021

- but nothing guarantees us today that we will be able to really make it.

pros: - hope for a full in-person workshop

cons: - too late to engage with snowmass

Speakers' availability for 2-4 September

Introductory talks

14:00	SM problems and FIPs from theoretical viewpoints	*Simon Knapen*	
	CERN	14:00 - 14:40	
	What can we learn for particle physics from DM cosmological observations?	*Alexey Boiarskyi*	
15:00	*CERN*	14:40 - 15:10	
	Theory overview of DM models in the low (<10 GeV) mass range	*Asher Berlin*	
	CERN	15:10 - 15:40	
	Status and prospects of DM direct detection experiments in the low (< 10 GeV) mass region	*Susana Cebrian*	
16:00	*CERN*	15:40 - 16:10	
	Coffee break		
	CERN	16:10 - 16:40	
	Search for FIPs at collider based experiments (overview)	*Heather Russell*	
17:00	*CERN*	16:40 - 17:10	
	Search for FIPs with experiments at extracted beams (overview)	*Bertrand Echenard*	
	CERN	17:10 - 17:40	
	Search for very low mass FIPs (atomic physics, quantum technology)	*Dr Yevgeny Stadnik*	
18:00	*CERN*	17:40 - 18:10	

If we decide to go for an online version this session will be scheduled on 31st August, afternoon (check with speakers)

All OK (but Susana Cebrian, perhaps available for online version?)

Speakers' availability for 2-4 September

HNL session:

09:00	Theoretical introduction to seesaw models and their connection to leptogenesis	*Marco Drewes*	
	CERN		09:00 - 09:30
	HNLs and their relation to astroparticle and cosmology (3.5 keV line, BBN, measurement of the absolute neutrino masses (KATRIN, Euclid, etc.)	*Prof. Oleg Ruchayskiy*	
10:00	HNLs and their relation (or non-relation) to active neutrino physics (PMNS, δ CP , 0 νββ decay, m(lighest neutrino),..)	*Jacobo Lopez Pavon*	
	coffee break		
	CERN		10:20 - 10:40
	Search for HNLs at extracted beams (neutrino experiments (T2K), NA62-kaon and dump mode, prospects for DUNE)	*Alexander Izmaylov*	
11:00	Search for HNLs at LHCb, ATLAS, CMS: status and prospects	*Lesya Shchutska*	
	CERN		11:05 - 11:30
	Prospects Search for HNLs with SHiP, MATHUSLA, FASER, and CODEX-b	*Nicola Serra*	
	CERN		11:30 - 11:55
12:00	Prospects to search for HNLs at future ee/ep/pp colliders	*Oliver Fischer*	
	CERN		11:55 - 12:20

All OK (only Lesya not available 2/9)

September 1st , afternoon (check with speakers)

Dark Photon session:

14:00	Early cosmology (BBN, re-ionisation, 21 cm) constraints on new (feebly-interacting) physics (covering vector, scalar, pseudo-scalar portals)	*Maxim Pospelov*	
	Search for LDM and vector mediators at accelerator-based experiments in US (HPS, BDX, Mini-Boone, LDMX)	*Timothy Knight Nelson*	
15:00	Search for LDM and Vector/ALPs mediators at experiments at extracted beam lines (NA64, NA62, MESA,....) (mass range typically covered: < 1 GeV)	*Sergei Gninenko*	
	Search for LDM and vector mediators at B-factories (Belle-II, including BaBar ad Belle results)	*Prof. Christopher Hearty*	
	CERN		15:25 - 15:50
	coffee break		
16:00	*CERN*		15:50 - 16:10
	Search for LDM and vector mediators at LHCb, ATLAS, CMS: status and prospects	*Philip Ilten*	
	CERN		16:10 - 16:35
	Search for LDM and vector mediators at FASER, CODEX-b, SHiP, MATHUSLA	*Jakob Salfeld-Nebgen*	
	CERN		16:35 - 17:00

All OK (only C. Hearty not available, but maybe available for online version)

September 2nd , afternoon

Speakers' availability for 2-4 September

Axion/ALP session:

09:00	Status of stellar and astrophysics constraints on new (feebly-interacting) physics (covering vector, scalar, pseudo-scalar portals)	*Maurizio Giannotti*
	Axions/ALPs as DM and/or light DM mediators: phenomenology *CERN* 09:30 - 10:00	*Andreas Ringwald*
10:00	QCD axion beyond the axion band *CERN* 10:00 - 10:25	*Prateek Agrawal*
	coffee break *CERN* 10:25 - 10:45	
11:00	Axions/ALPs as DM and/or light DM mediators: overview of experimental approaches in the low mass range	*Igor Garcia Irastorza*
	axions/ALPs phenomenology at accelerator-based experiments *CERN* 11:15 - 11:45	*Felix Kahlhoefer*
12:00	Search for axions/ALPs at the LHC (ATLAS, CMS, LHCb): mass range > 10 GeV *CERN* 11:45 - 12:10	*David d'Enterria*

Felix is available only on the 4th
(maybe this changes if online)
I have to check with Igor/Andreas

September 3rd, afternoon

Dark Scalar session:

14:00	Scalar portal and its connection to Higgs physics from a theory viewpoint *CERN* 14:00 - 14:30	*stefania gori*
	Cosmology and particle phenomenology of feebly interacting scalars *CERN* 14:30 - 15:00	*Fedor Bezrukov*
15:00	Experimental constraints on the exotic Higgs width *CERN* 15:00 - 15:25	*Maria Cepeda*
	Direct searches for feebly-interacting dark scalars at the central detectors of the LHC: status and prospects *CERN* 15:25 - 15:50	*Chris Hays*
16:00	coffee break *CERN* 15:50 - 16:10	
	Search for light feebly-interacting scalar particles at extracted beam lines (SeaQuest @ FNAL, NA62, SHiP,....)	*Joel Christopher Swallow*
	Prospects to search for light feebly-interacting scalar particles at MATHUSLA, CODEX-b, FASER *CERN* 16:30 - 16:55	

All OK (talk at MATHUSLA & co unassigned: D. Curtin?)

September 4th, afternoon

FIPs 2020 Proceedings: proposal

How about a short version [sent to arXiv] of the PBC BSM report
including updated summary plots for all the portals
and experimental and theoretical progress?

FIPs (202X) proceedings could become a reference for the community
[as the PBC-BSM report has been so far,
1 citation/5-6 days on average]

This clearly requires a bit of work from our side
[but I think is worth..]

What do you think?

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH (CERN)

CERN-PBC-REPORT-2018-007

Physics Beyond Colliders at CERN
Beyond the Standard Model Working Group Report

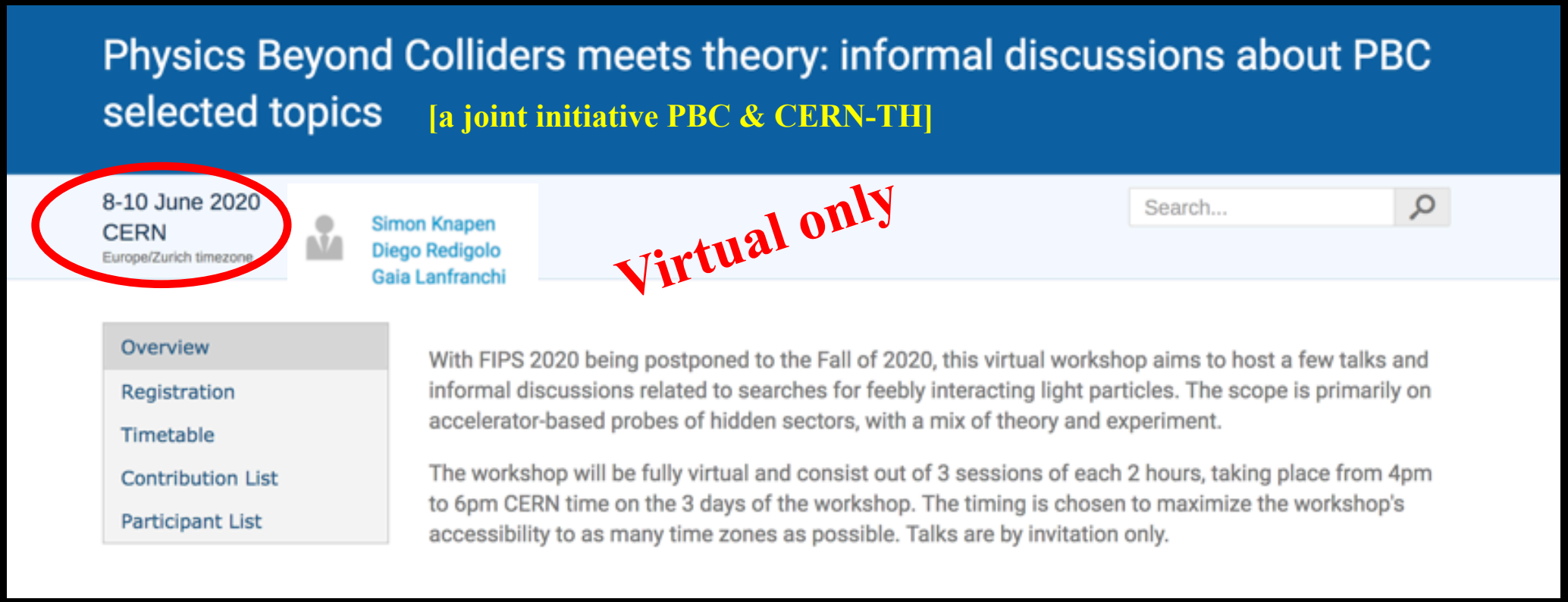
J. Beacham[1], C. Burrage[2,*], D. Curtin[3], A. De Roeck[4], J. Evans[5], J. L. Feng[6], C. Gatto[7], S. Gninenko[8], A. Hartin[9], I. Irastorza[10], J. Jaeckel[11], K. Jungmann[12,*], K. Kirch[13,*], F. Kling[6], S. Knapen[14], M. Lamont[4], G. Lanfranchi[4,15,*,**], C. Lazzeroni[16], A. Lindner[17], F. Martinez-Vidal[18], M. Moulson[15], N. Neri[19], M. Papucci[4,20], I. Pedraza[21], K. Petridis[22], M. Pospelov[23,*], A. Rozanov[24,*], G. Ruoso[25,*], P. Schuster[26], Y. Semertzidis[27], T. Spadaro[15], C. Vallée[24], and G. Wilkinson[28].

Abstract: The Physics Beyond Colliders initiative is an exploratory study aimed at exploiting the full scientific potential of the CERN's accelerator complex and scientific infrastructures through projects complementary to the LHC and other possible future colliders. These projects will target fundamental physics questions in modern particle physics. This document presents the status of the proposals presented in the framework of the Beyond Standard Model physics working group, and explore their physics reach and the impact that CERN could have in the next 10-20 years on the international landscape.

* PBC-BSM Coordinators and Editors of this Report
** Corresponding Author: Gaia.Lanfranchi@lnf.infn.it

While waiting for FIPs 2020……

https://indico.cern.ch/event/910753/overview



… you are all invited to join us!

JENAS: First Joint Meeting
ECFA-APPEC-NuPECC
Orsay, October 2019

✓ Large attendance

- 230 participants, present the chairs of the three communities (J. d'Hondt, T. Montaruli and M. Lewitowicz) the Research & Computing CERN Director (E. Elsen), head of CERN EP Department (M. Krammer), CERN Council Chair (U. Bassler), former ECFA Chair (T. Nakada) and many representatives of European funding agencies.

✓ Goal: Establish a common platform to seek for synergies for:

- Analysis and interpretation of results, theory models;
- Technology challenges;
- Data sharing, software and computing.
- Outreach (a unique story to tell?).

✓ Result of the meeting:

Open call for novel Expressions of Interest (EoIs)

iDMEu: Expression of Interest as joint-venture ECFA-APPEC-NuPECC

https://indico.cern.ch/event/869195/overview

proponents

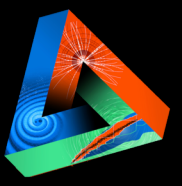
Caterina Doglioni
Elena Cuoco
Federica Petricca
Florian Reindl
Gaia Lanfranchi

Jocelyn Rebecca Monroe
Marco Cirelli
Silvia Pascoli

More than 250 signatories to date, including distinguished physicists and renowned experts in the field.

First kick-off meeting will be likely in spring 2021

[Sign the EoI if you want to be informed about updates]



iDMEu: Towards facilitating communication and result sharing in the Dark Matter community at the European level

✓ Look for Synergies and complementarities across very different communities:

- colliders, fixed-target, beam dump, flavor, axions/ALPs, DM direct and indirect detection experiments
- particle and astroparticle theory, and cosmology.

✓ by developing a common platform where :

- Results and underlying models are discussed and compared
- Pointers to Data, Results and relative analysis tools are shared (via meta-repositories)
- Common plots DM related are compiled
- Main scientific (workshop, conferences, seminars,…) and general public events are advertised.

✓ Communities we plan to involve:

- FIPs 2020 community (hence: us!)
- DM and LLP @ LHC WG
- Physics Beyond Colliders
- DM direct and indirect detection experiment representatives
- axion/ALP communities
- particle theory (CERN-TH, others) and astroparticle theory (EuCAPT = European Consortium for AstroParticle Theory)

✓ and (on more technical side):

- ESCAPE (European Science Cluster of Astronomy and Particle Physics ESFRI research infrastructures,
- The Phystat-DM community
- direct detection plotting tools developers, e.g. DMTools and SuperCDMS limit plotter)