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UK Theory

RECFA visit to UK

London, 13/09/24

LEVERHULME
TRUST



Science and
Technology
Facilities Council



University
of Glasgow

The UK Particle Theory Landscape - PPGP[T]

- ▶ a fully-integrated research environment

Quantum
Field Theory

String Theory

Phenomenology

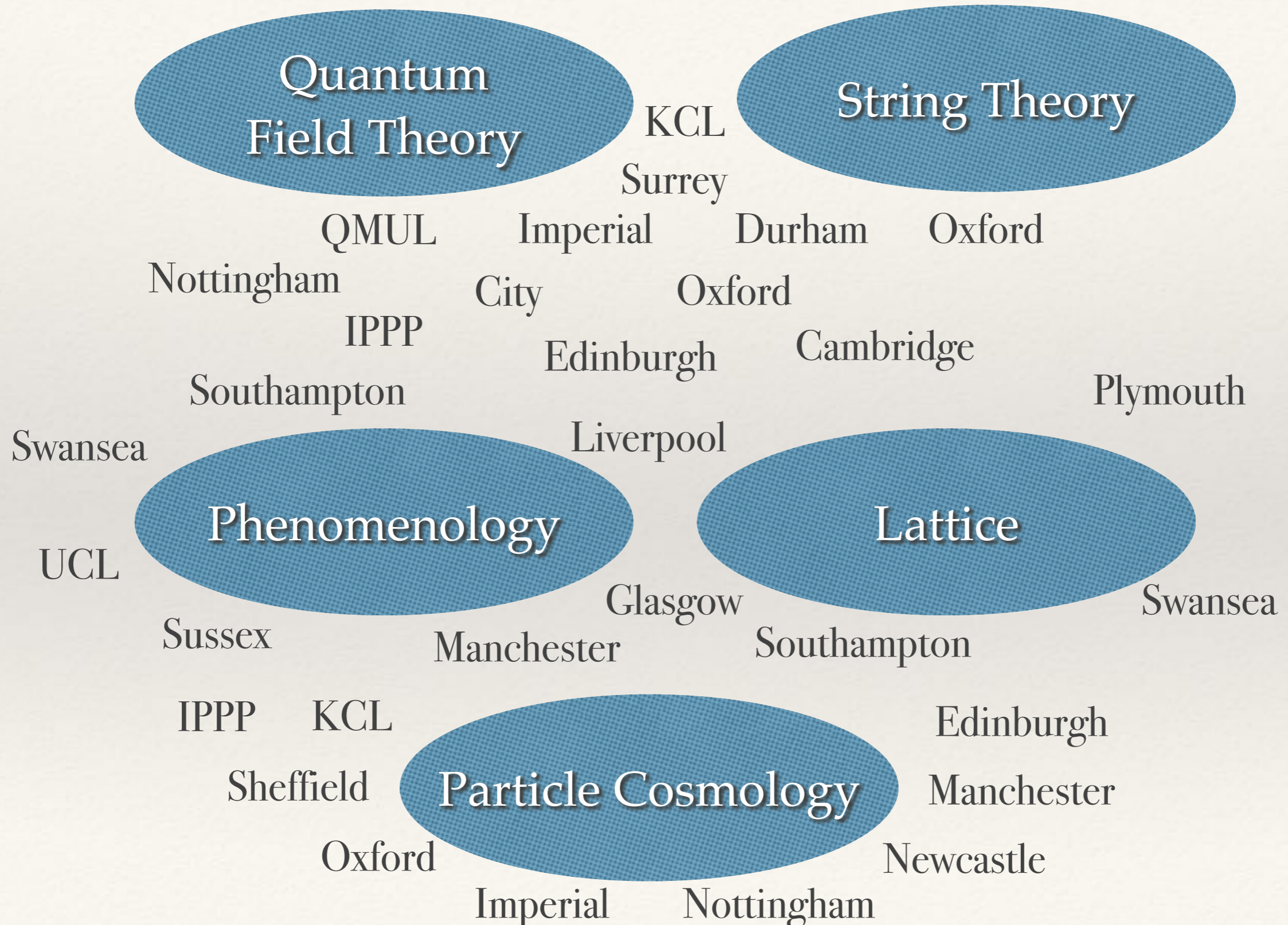
Lattice

Particle Cosmology

PPGP[T] programme categories

The UK Particle Theory Landscape - PPGP[T]

- ▶ a fully-integrated research environment



The UK Particle Theory Landscape - PPGP[T]

- ▶ a fully-integrated research environment
 - > 200 academics engaged in PPT research across 25 institutions

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Particle Cosmology

- ▶ virtual institutes
- ▶ consortia
- ▶ Newton Institute
- ▶ Summer Schools & Conferences

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Particle Cosmology

new
structures

new
techniques ...

- ▶ interconnecting different subdisciplines = physics case innovation

The UK Particle Theory Landscape - PPGP[T]

- ▶ Leadership positions with direct ECFA relevance

LHCHWG

mandated recommendations
informing physics case at
LHC and beyond

MC
development &
support

Sherpa, Herwig, MCFM,
HEJ, LHAPDF, RIVET,
NNPDF, MSTW/MSHT, ...

Precision
Calculations

N^n LO, N^n LL
form factors,
...

new
methods in
HEP

(Q)ML,
amplitudes,
duality,
...

- ▶ publications and relevance (diverse areas, different cultures etc.)

- ▶ 250 academics have 1 publication 250+
- ▶ 100 academics have 1 publication 400+
- ▶ 80 academics have 1 publication 500+

UK
academics
have an
impact in
their
sectors

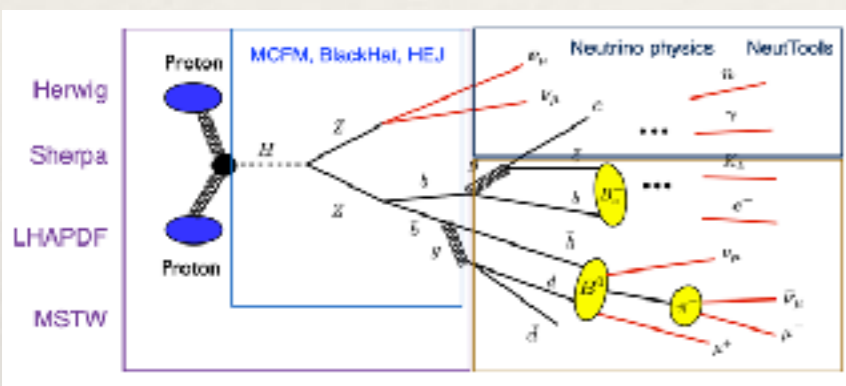
Institute for Particle Physics Phenomenology - IPPP

UK's National Centre for Particle Phenomenology

founded in 2000 as a joint venture of STFC and DU

core activities (independent review in 2021):

Research Support

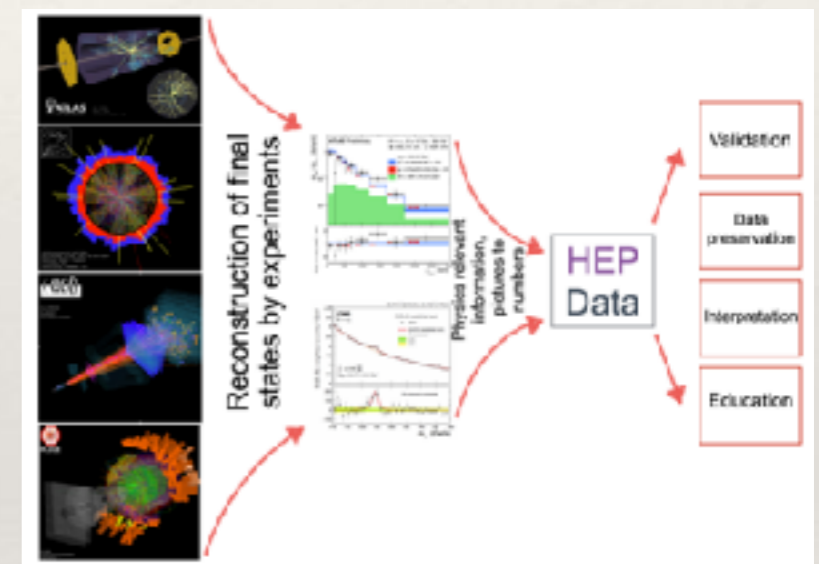


- ▶ end-to-end coverage of HEP processes (inc. tool development)
- ▶ support for all HEP across experiment and theory

Science Exchange

- ▶ Organisation of over 20 workshops, conferences, PhD schools annually
- ▶ Research facilitation
 - DIVA programme
 - Research Associateships
 - Senior Experimental Fellows

Computing/Data

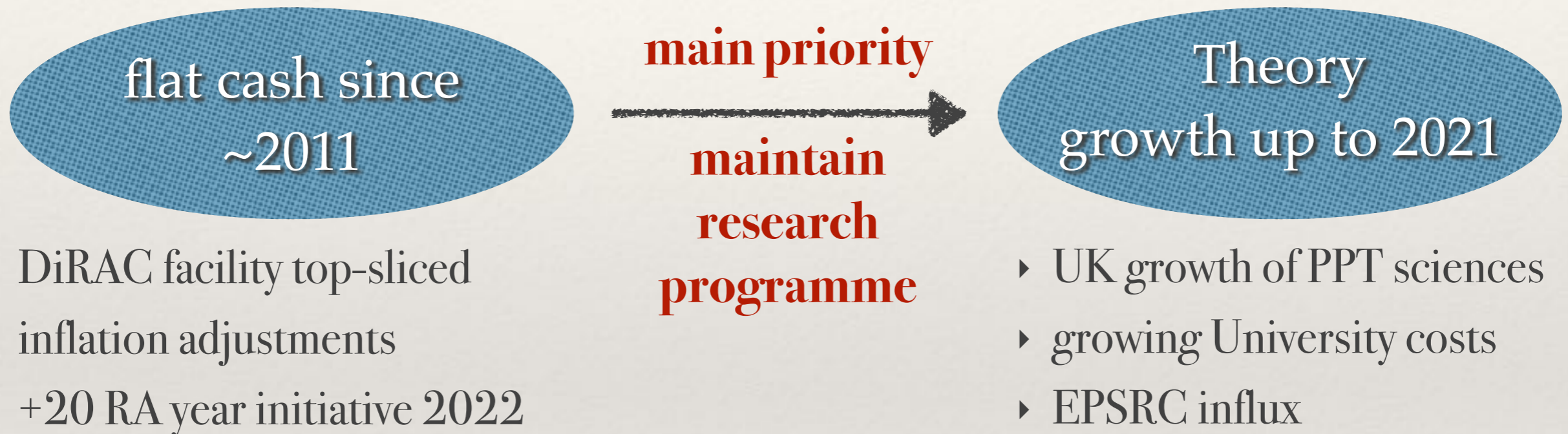


- HEPData: store & preserve HEP-relevant data
- HEPForge: HEP software development
- GridPP, HPC and IT security

The UK Particle Theory Landscape - PPGP[T]

STFC PPGP(T) envelope: 120 academic FTE + 130 (+20) RA years
+ derived support costs

- ▶ flat cash funding for many years



overheads rising = recoup from academic FTE %

2019: staggered <20%

2022: 5%

190 bidding academics

220 bidding academics

Challenges ahead

- ▶ if flat cash funding continues against the existing trends in University funding, there is no choice but cut into scientific programme

reduced academic time + RA numbers

- ▶ this could mean a reduced contribution to ECFA-relevant progress:

slowing development of critical tools, ideas, and dissemination

- ▶ recruitment of talent base from outside the UK is increasingly challenging

- ▶ 30% STFC DTP cap vs. intl fees (approx. 30k/year)
- ▶ ATAS visa requirements, fees and associated delays
- ▶ rising costs of PDRAs and overheads