



# THEORY AND METHODOLOGY: NEW DEVELOPMENTS

THE NNPDF COLLABORATION & N3PDF TEAM  
AMSTERDAM-BARCELONA-CAMBRIDGE-EDINBURGH-INFN-MILAN-NIKHEF



PDF4LHC MEETING

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## SUMMARY

### THEORY DEVELOPMENTS

- ELECTROWEAK CORRECTIONS      **CHRISTOPHER SCHWAN** (MILAN)
- NUCLEAR AND DEUTERON UNCERTAINTIES      **ROSALYN PEARSON** (EDINBURGH)

### PDF PROPERTIES AND THEIR IMPLEMENTATION

- PDF POSITIVITY (TH)      **FELIX HEKHORN** (MILAN)
- POSITIVITY (PH), INTEGRABILITY, ARCHITECTURE & BASIS **TOMMASO GIANI** (NIKHEF)

### PDF DETERMINATION METHODOLOGY

- HYPEROPTIMIZATION AND  $K$ -FOLDING      **JUAN CRUZ-MARTINEZ** (MILAN)
- METHODOLOGY CORRELATIONS      **ROY STEGEMAN** (MILAN)

### PDF VALIDATION

- CLOSURE TESTS      **MICHAEL WILSON** (EDINBURGH)
- FUTURE TESTS      **JUAN CRUZ-MARTINEZ** (MILAN)

### DATASET SELECTION

- WEIGHTED PDFs      **ZAHARI KASSABOV** (CAMBRIDGE)

### PDF DELIVERY

- PDF REPLICA COMPRESSION      **TANJONA RABEMANANJARA** (MILAN)

# THEORY DEVELOPMENTS

# PDF PROPERTIES AND THEIR IMPLEMENTATION

# PDF DETERMINATION METHODOLOGY

# PDF VALIDATION

# DATASET SELECTION

PDF DELIVERY



# OUTLOOK

- PROGRESS  $\Rightarrow$  ALL ASPECTS OF PDF DETERMINATION;  
FROM THEORY TO FINAL DELIVERY
- SIZABLE IMPACT ON PDF DETERMINATION:
  - SUBSTANTIAL SPEED-UP, BY MORE THAN FACTOR 10
  - INCREASED ACCURACY
  - SUBSTANTIAL INCREASES IN PRECISION  $\Rightarrow$  SMALLER PDF UNCERTAINTIES
- BIG IMPACT ON NNPDF4.0  $\Rightarrow$  NEXT GENERATION PDF SET  
(**E. NOCERA**'s talk)

EXTRAS