

Core Working Group Updates

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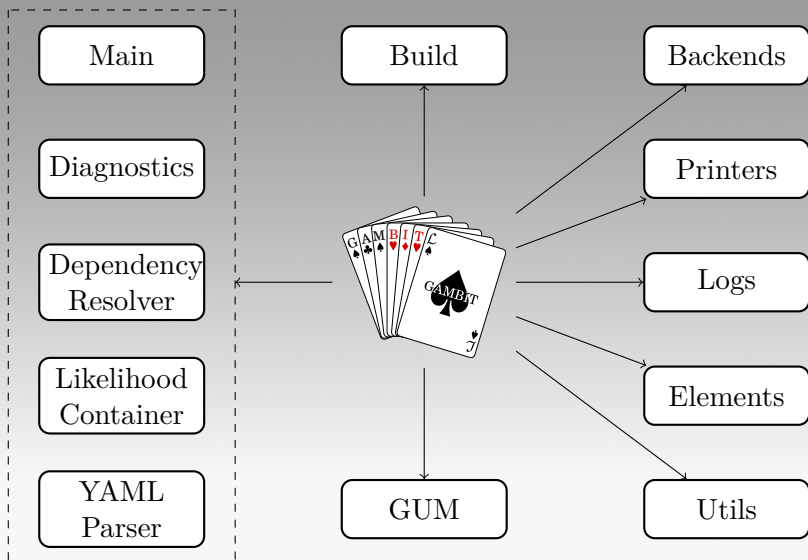
GAMBIT XV

WG Members

- Recently active members
 - **Tomas Gonzalo (convenor)**
 - Anders Kvellestad
 - Chris Chang
 - Pat Scott
 - Patrick Stoecker
- Formerly active members
(please come back)
 - **Markus Prim (convenor)**
 - Peter Athron
 - Fruzsina Agocs
- New members to list (?)
 - Alex Woodcock
 - Adil Jueid



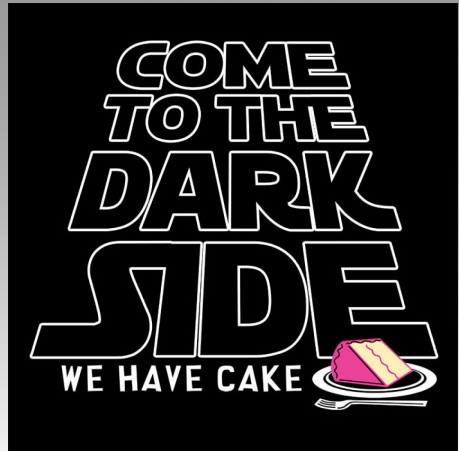
What is Core?



Why join core?

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- Find out what goes on under the hood in GAMBIT
- Learn /get better at coding in C++, Python, Fortran, and more
- Lower threshold for authorship in long-author papers
- Usually more likely to be invited to participate in short-author papers



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- **We really really need more people**



Recent updates

GAMBIT 2.3.0, 2.3.1, 2.4.0, 2.4.1

- Support for EWMSSM plus gravitino, DM simplified models
- SM measurements, DM indirect detection with antiprotons
- New LHC searches and dijet searches
- New backends: Rivet 3.1.5, Contur 2.1.1, ATLAS FullLikes, simple_xs, pbarlike 1.0
- Updated backends: DarkSUSY 6.4.0, HepLike 2.0, DDCalc 2.3.0
- Added ColliderBit dependencies: HepMC 3.2.5, YODA 1.9.7
- Core: MSSM model tree, metadata, scanID, process lock
- Increase supported pybind11 version to 2.10.1
- Improved support for OSX
- Updates to GUM & BOSS
- Bugfixes++

Unreleased updates

- Changes merged to the `master` branch but not yet released
- Mac runners **CC**
 - new CI tests on OSX (x64, arm64)
 - machines are UQ, not sure yet what'll happen when CC leaves
- Remove Python 2 support **AK**
 - GAMBIT will no longer support python 2 backends
 - python 2 CI tests removed
- Rules objects **PS**
 - Complete reworking of rules and obsolesces
 - PS to talk about it later today

Unresolved PRs

- *Add diagnostics for module functions and backend functions* **PSt**
- *Defining and Enforcing a Code Style* **MP**
- *Make diagnostic system aware of un-compiled modules* **MP**
- *Patch to the yaml_node_utility made by Andy* **TP**
- *BOSS typedef header* **AK**
- *Cmake system for downloading datasets* **AK, TG, CC**
- *Vevacious dependencies* **AF, TG, AK, PS**
- *Python scanners* **GM**
- *Contur 2.1.1→2.4.1, Rivet 3.1.5→3.1.8 upgrade* **TP**
- *Two Higgs Doublet Models* **TG, PS, MW, AW**
- *Cmake scan fix* **GM, AK**
- *Reinstated intel classy compilation* **WH**

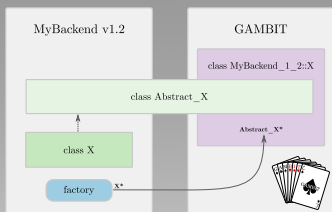
Major Core projects

Template BOSS AK, TG

- Backend C++ codes
- Not working if X is templated
- Jan 2022: Pawsey interns
Zelun Li & Joel West

- Generic templates
- Specialized templates
- Abstract classes

- Wrapper classes
- GAMBIT typedefs
- Finished sometime earlier this year (except template covariance)
- Works with FlexibleSUSY (after some patching)



```
template <T> class X
template<> class X<int>
```

```
Abstract_X<T>
Abstract_X<int>
```

```
MyBackend_1_2::X__int
```

```
MyBackend_1_2::X<int>
```

Major Core projects

SpecBit redesign

- Joint Precision + Core project
- Uses template BOSS, working for FS since recently
- Most things ported to use new **Spectrum** class
- Only missing functionality is running spectrum

PA, TG, BF

HDF5 Printer

- HDF5 v2 not working on some systems
- Help from Pawsey to resolve

PP

Fast-slow scanners

- Joint Scanner + Core project
- Many subtasks pending in Core TODO list

GM, WH, TG?

Major Core projects

GAMBIT 2

- Any non-documented code since GAMBIT 1
- Big Core changes
 - Python backends
 - Template BOSS
 - Dependency resolution changes: subcaps
 - New rules objects
 - Citation system
 - New printers
 - ...
- Undocumented module development
 - SpecBit redesign
 - FlavBit redesign (undocumented)
 - ColliderBit redesign (CBS?)
- Full list of expected items in draft