

Royal Belgian Institute for Space Aeronomy (BIRA-IASB)

Institut royal d'Aéronomie Spatiale de Belgique (IASB)

Koninklijk Belgisch Instituut voor Ruimte-Aeronomie (BIRA)



New technologies and models in SPENVIS Next Generation

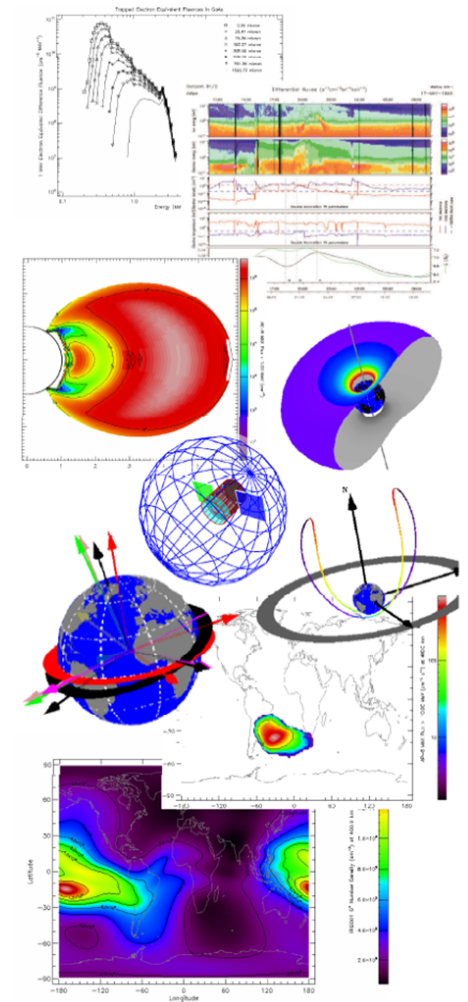
Stijn Calders

on behalf of the whole project team:



Space Environment Information System (SPENVIS)

- Web application with models of the space environment and its effects on spacecraft components & astronauts
 - Different orbits around Earth, Mars & Jupiter, e.g. GEO, elliptical, hyperbolic, uploaded trajectory
 - Trapped radiation particles, solar energetic particles, GCRs, meteoroids & debris
 - Total dose, single event upsets, spacecraft charging, solar cell damage, biological effects etc.
 - European Co-operation for Space Standardization (ECSS) recommendations



SPENVIS Legacy

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- ESA Operational software **publicly available since 1998**
- Developed & maintained for ESA by BIRA-IASB since 1996
- Also federated in ESA's Space Situational Awareness (SSA) Space Weather Service Network
- Large User Community:
 - More than 13000 registered users (**~30% from the US**)
 - On average **500 active users per month**
 - Space industry, scientific community, Universities & Colleges

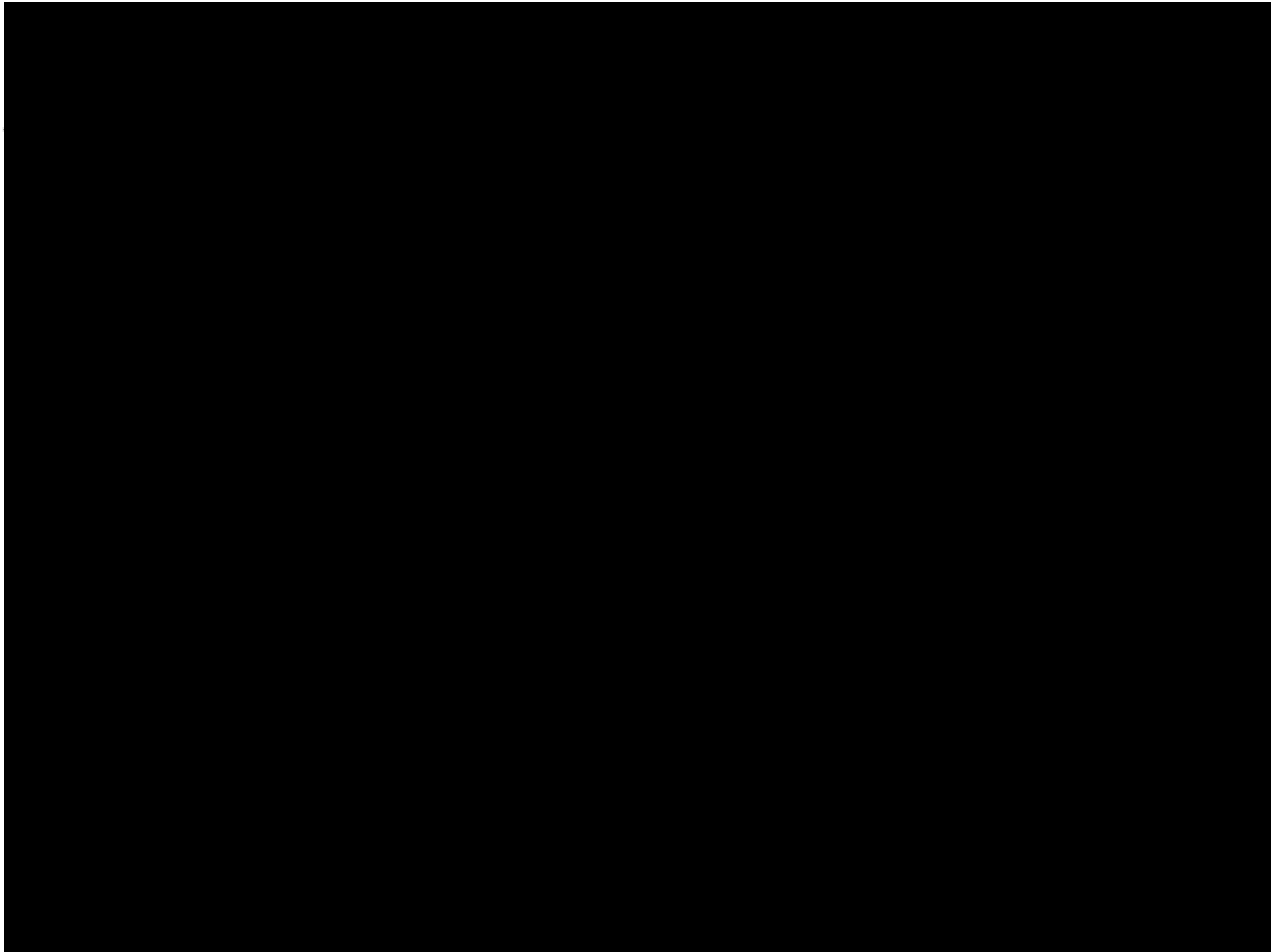
Presentation outline

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- Current SPENVIS
- Why do we need a new system?
- SPENVIS Next Generation
- How can you contribute to SPENVIS-NG?
- Collaboration with CCMC

CURRENT SPENVIS

<http://www.spennis.oma.be>



Why do we need a new system?

Lack of flexibility
in model coupling

Plug-in of new
models is not easy

No formal
M2M access

Artificial splitting
between orbital
and positional
models

Reduced capabilities
for the import of
user data

PREVIEW SPENVIS-NG

<http://www.spennis-ng.eu> (alpha release)

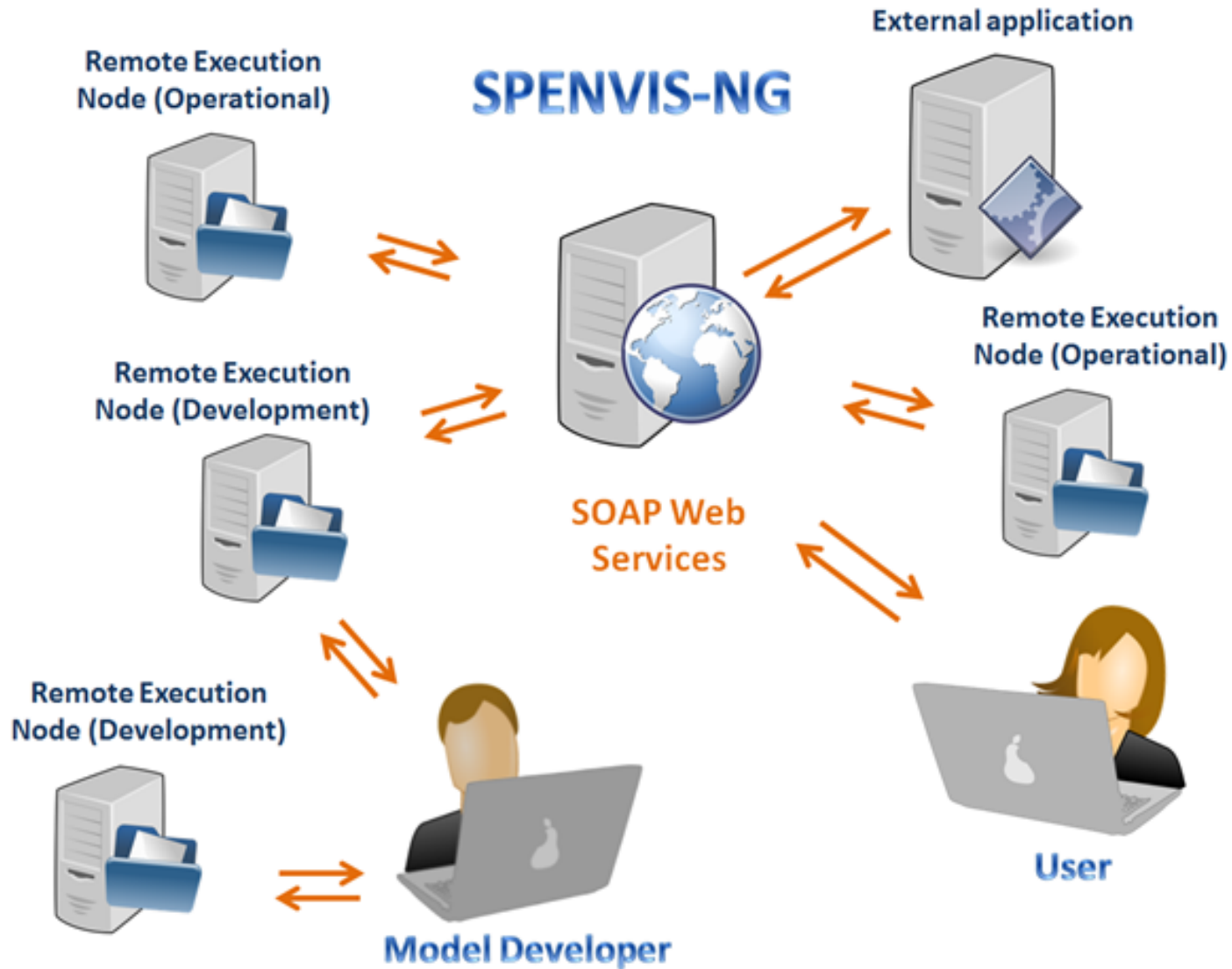


New models & updates

- New models foreseen:
 - ESA MEO model
 - ESA Interplanetary Electron Model (IEM)
 - ESA Slot Region Radiation Environment Model (SRREM)
 - Interface to ESA SEPTEM solar energetic particle (SEP) models
 - Badhwar and O'Neil GCR model
 - IRENE (AE-9/AP-9 models)
- Updates:
 - JOREM Radiation Environment Model
 - Geant4 tools (e.g. GRAS, MULASSIS etc.)
- **Public (beta) release planned for June.**

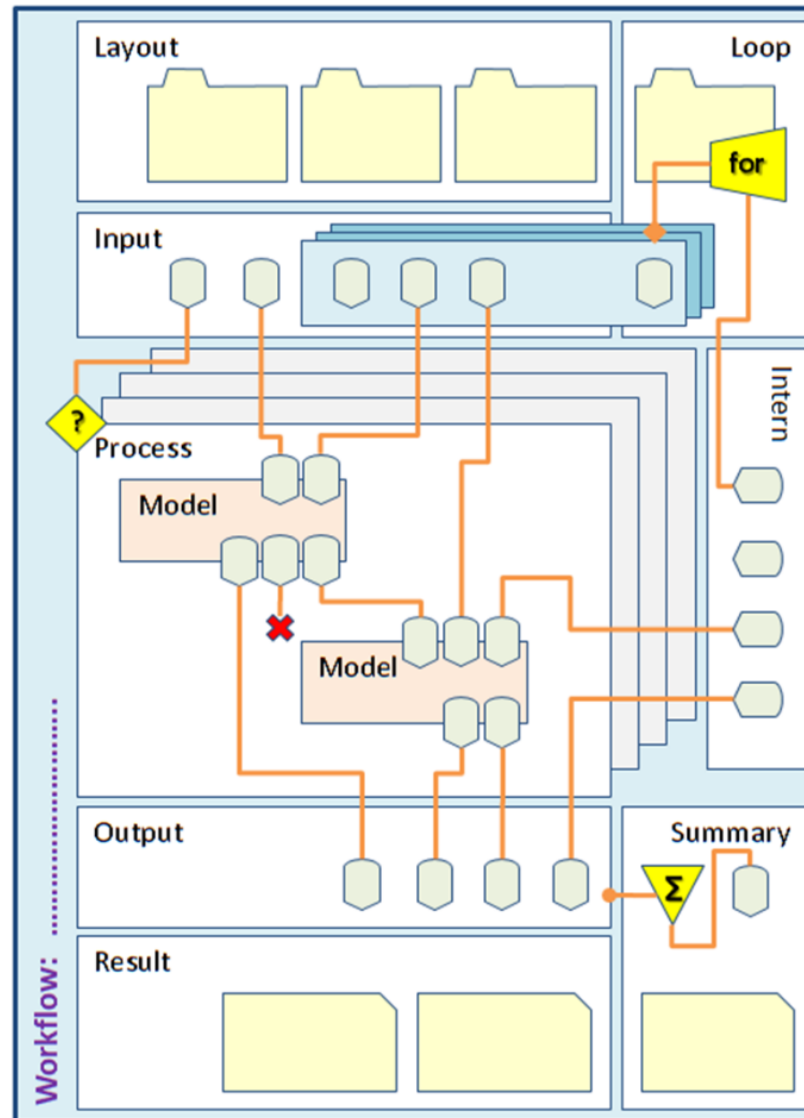
BEHIND THE SCENES

Behind the scenes



Behind the scenes

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HOW CAN YOU CONTRIBUTE TO THE SUCCESS?

How to contribute?

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- Become a beta tester
- Inform us about desired enhancements or usage scenario
- Create your own workflows. We can promote them to public workflows (“system wide”)
- Implement your own bundle (“model”)

➤ If you are interested, I will send you more information!

COLLABORATION WITH CCMC

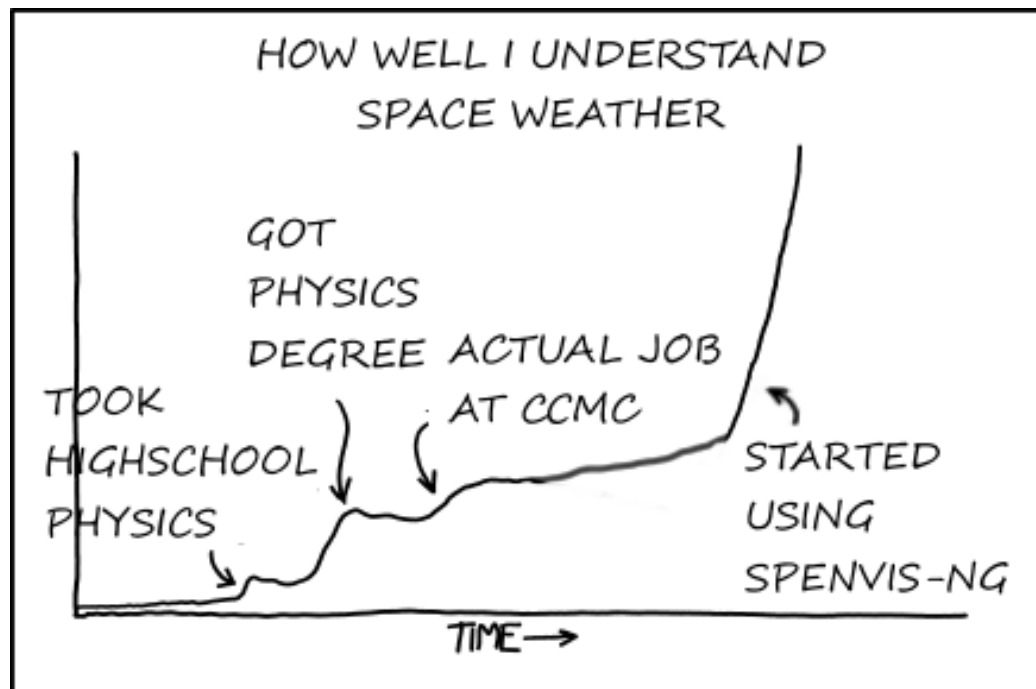
Collaboration with CCMC

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- Considering the deployment of a SPENVIS-NG Remote Execution Node at CCMC (and other institutes in the US).
- Interfacing CCMC and SPENVIS-NG together using:
 - CCMC's Kameleon
 - SPENVIS-NG's API

Thank you!

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* Based on <https://xkcd.com/1356/>