# Simulations et possibilités observationnelles de Gaia

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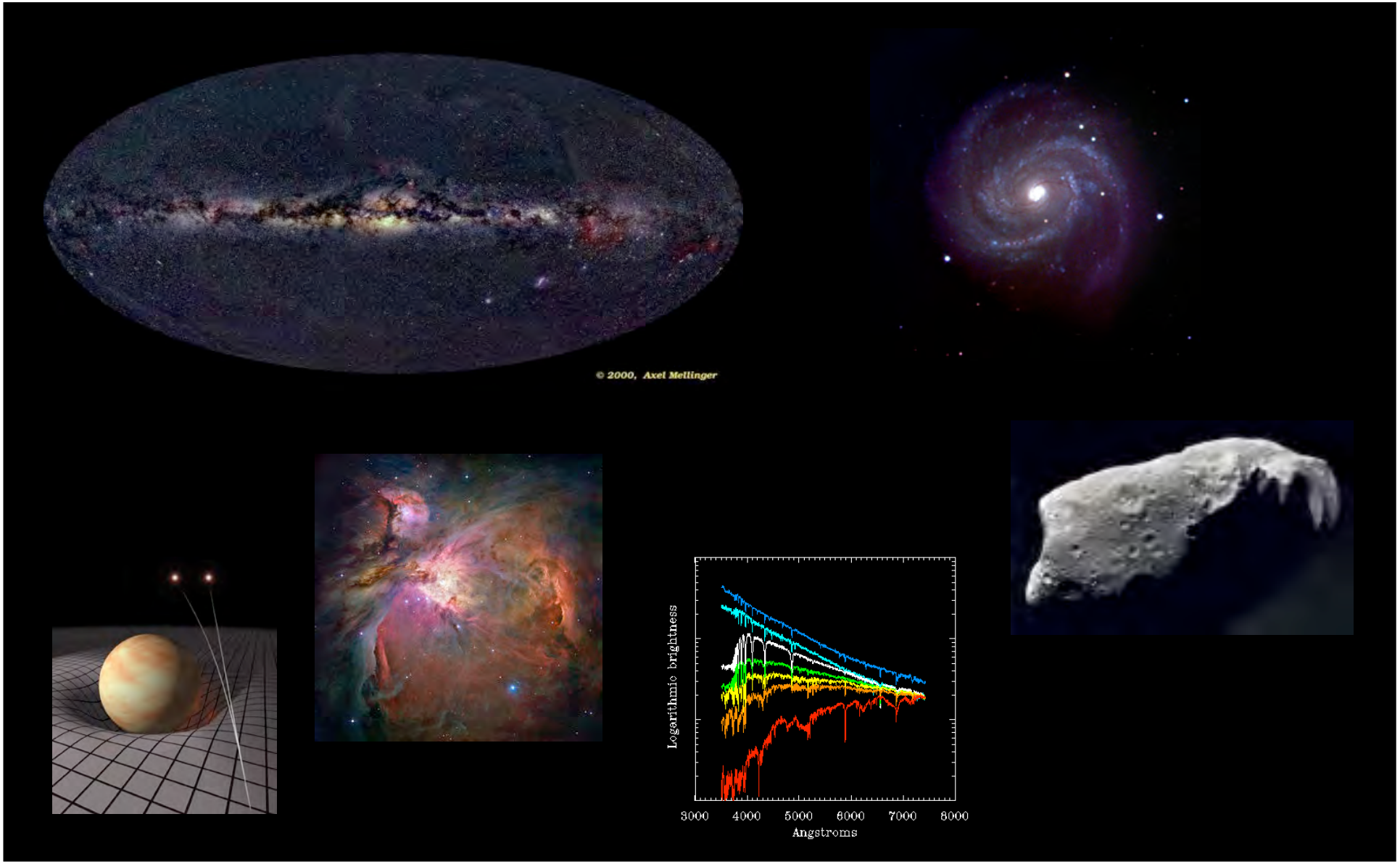
GEPI - Observatoire de Paris

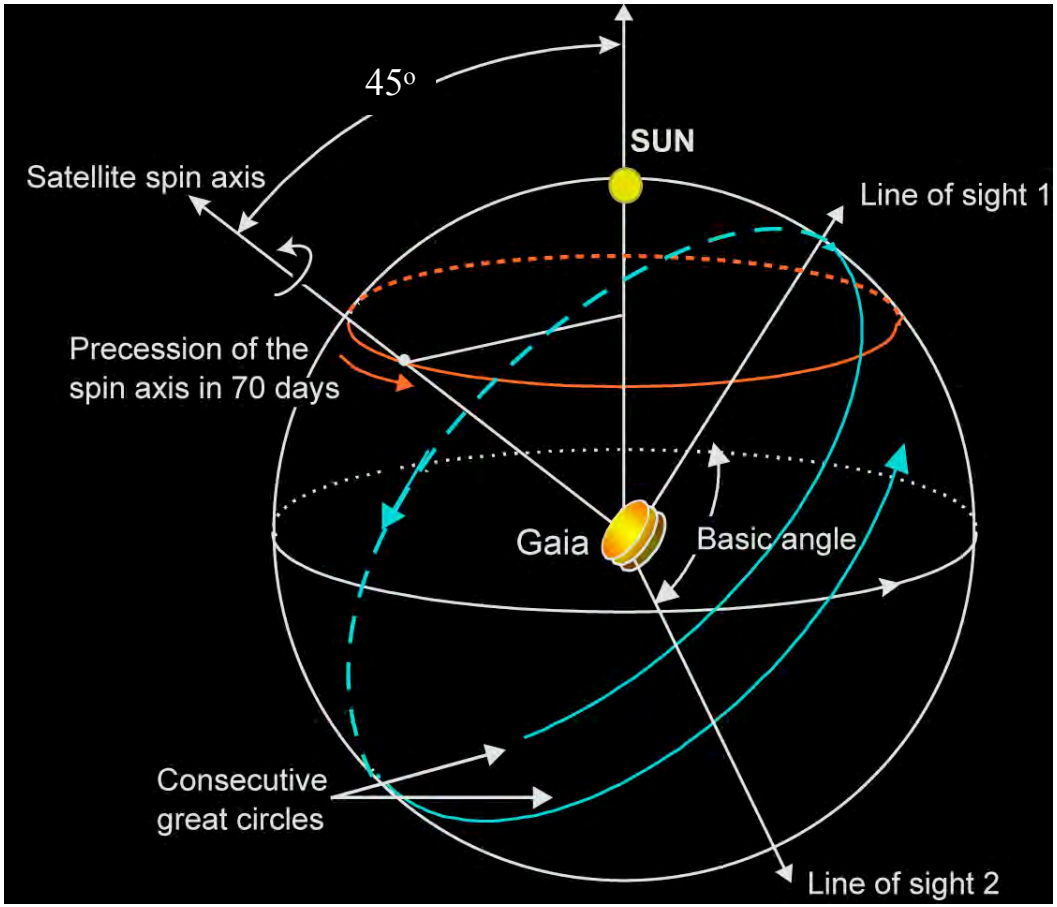
# Pourquoi des simulations ?

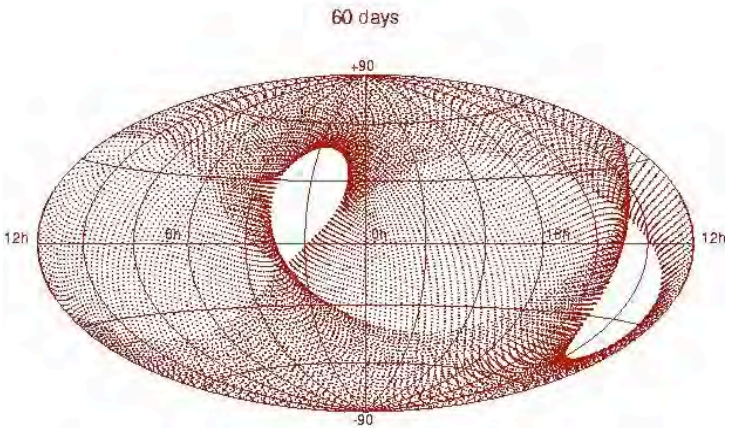
- Préparer la réduction de données
  - Mettre en place l'architecture du traitement des données
  - Développer les algorithmes
  - Vérifier les algorithmes et les modèles
  - Estimer les performances
- Pendant opération
  - Vérification des modèles scientifiques sur les données réelles

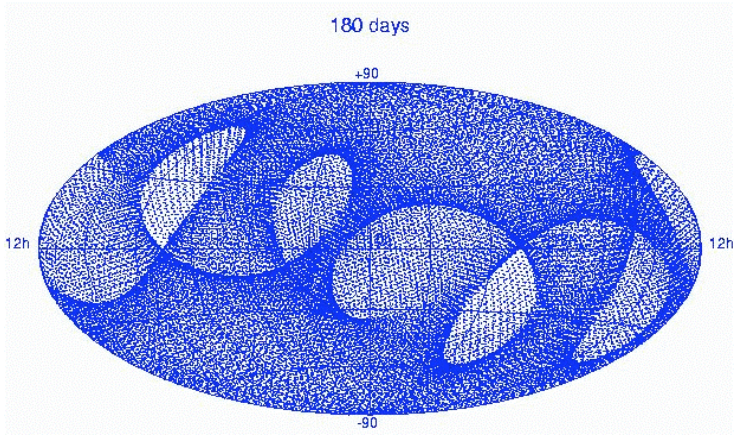
# L'univers visible par Gaia ⇨

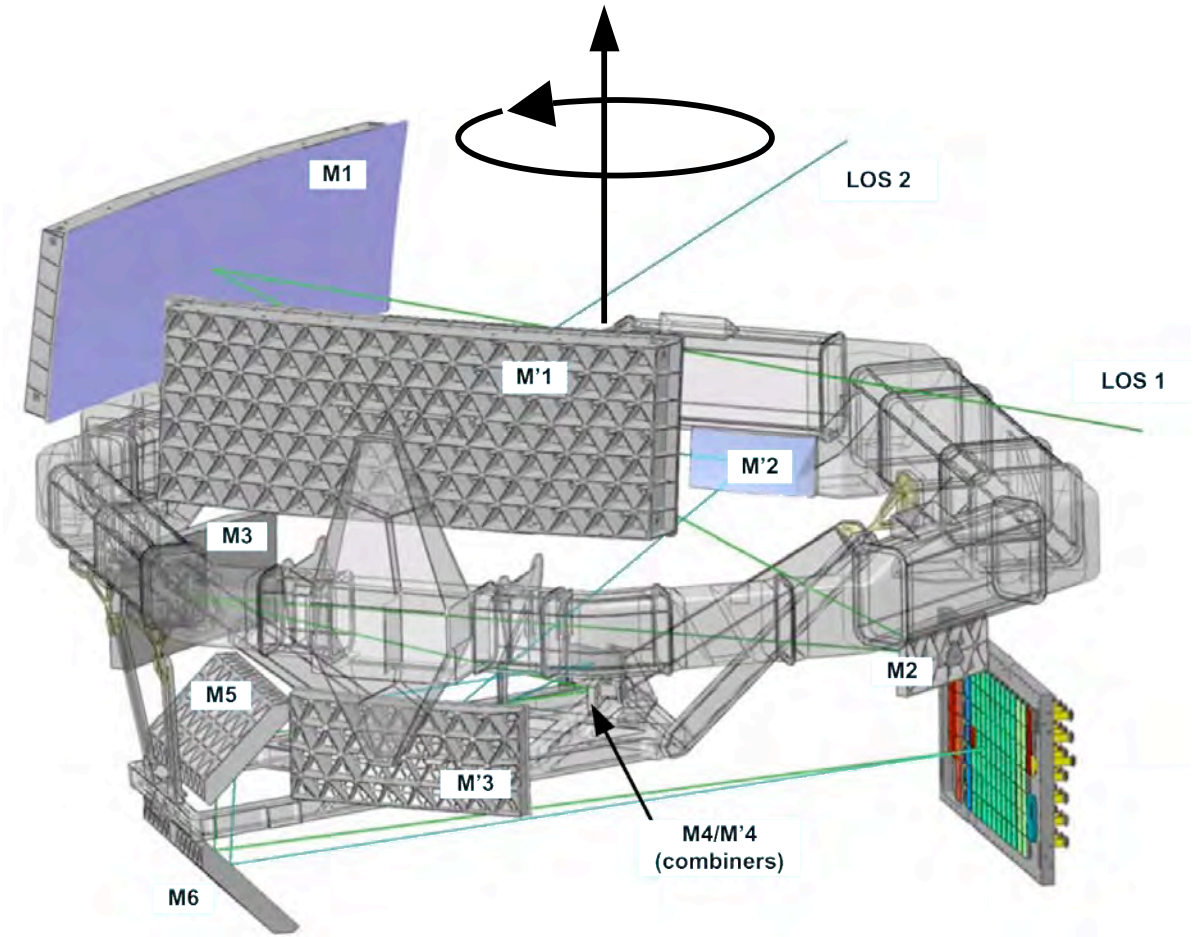


# ⇨ balayage du ciel ⇨

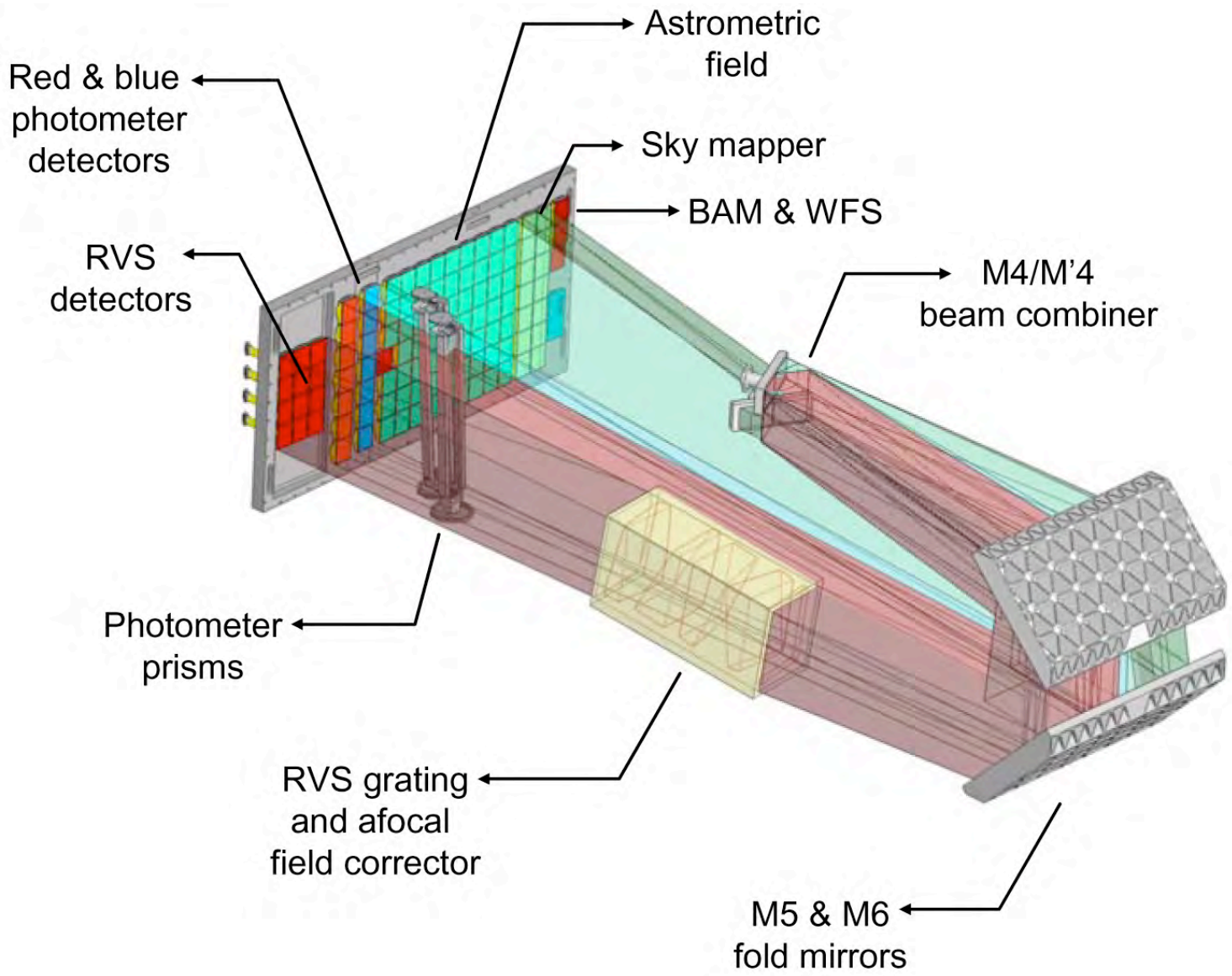


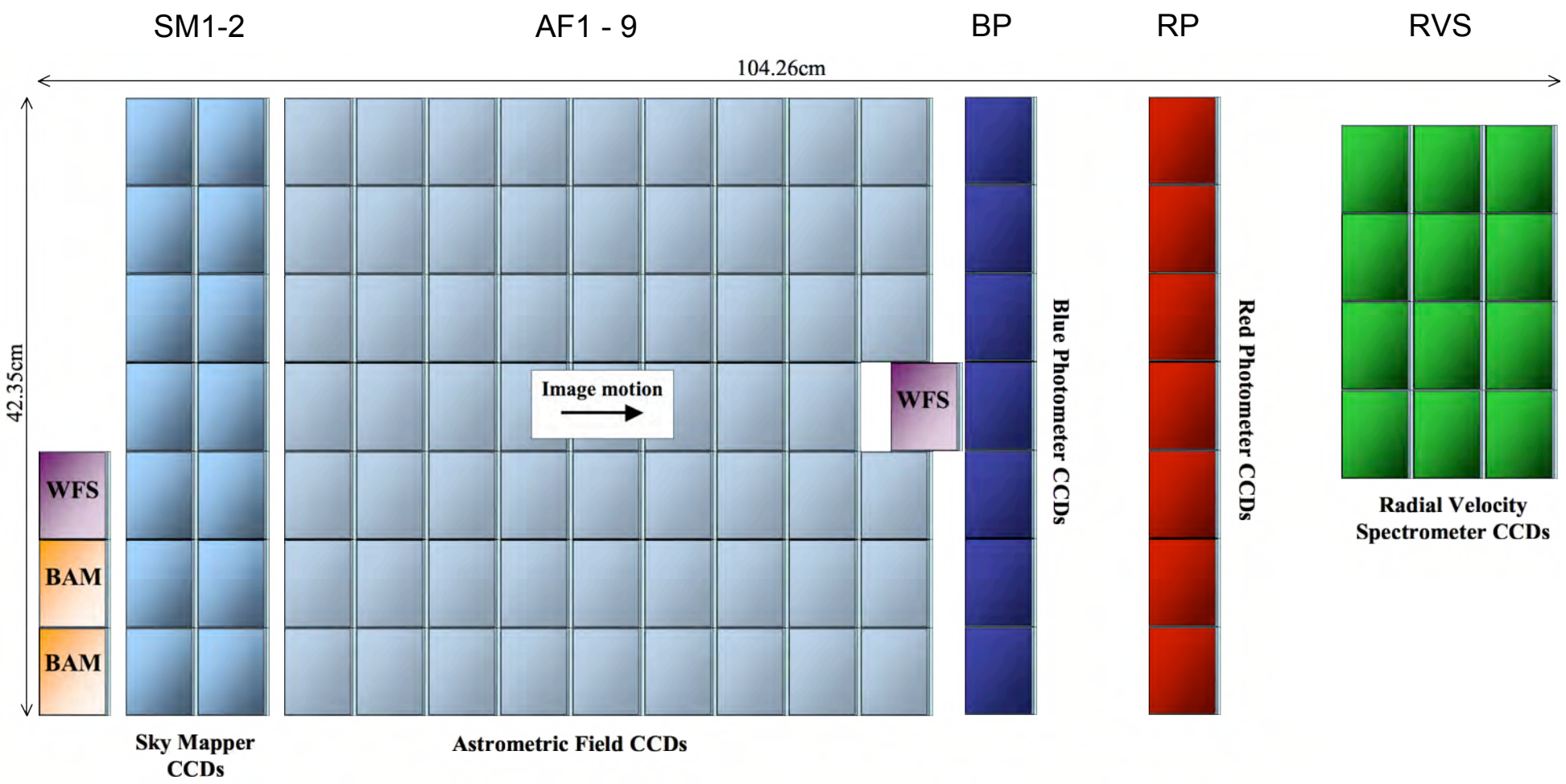




M1
LOS 2
M'1
LOS 1
M'2
M3
M2
M5
M'3
M4/M'4
(combiners)
M6

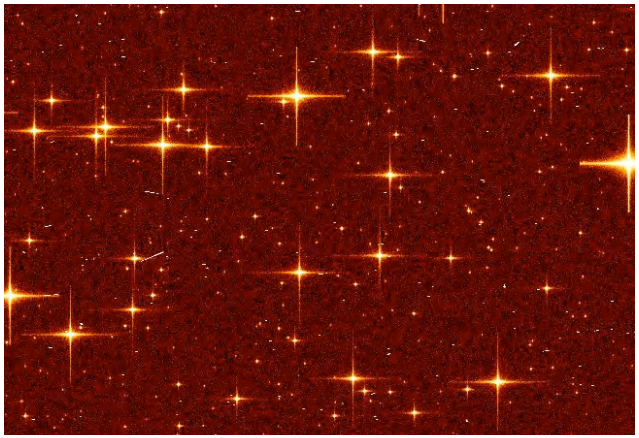
# ⇨ chemin optique ⇨



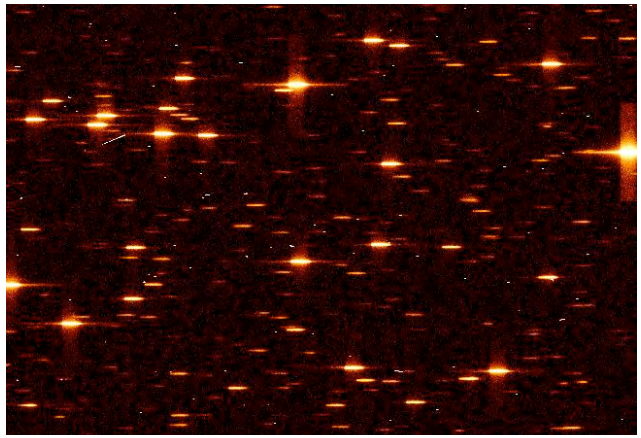
# ⇨ plan focal ⇨


SM1-2
AF1 - 9
BP
RP
RVS
104.26cm
42.35cm
WFS
BAM
BAM
Image motion
WFS
Blue Photometer CCDs
Red Photometer CCDs
Radial Velocity Spectrometer CCDs
Sky Mapper CCDs
Astrometric Field CCDs

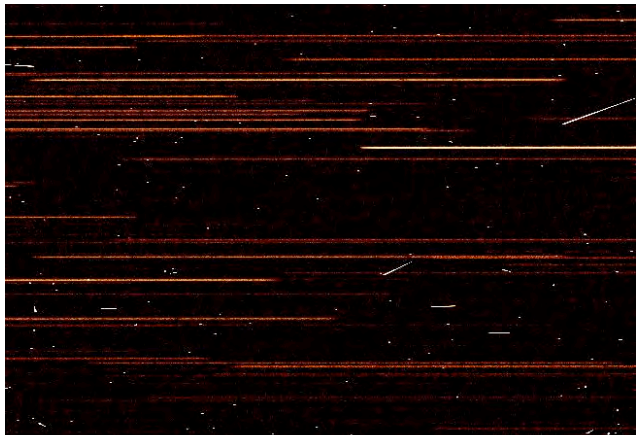
# ⇨ Collection des photons ⇨



AF

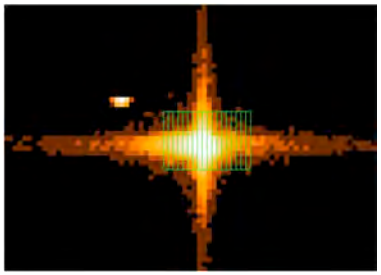


RP



RVS

⇨



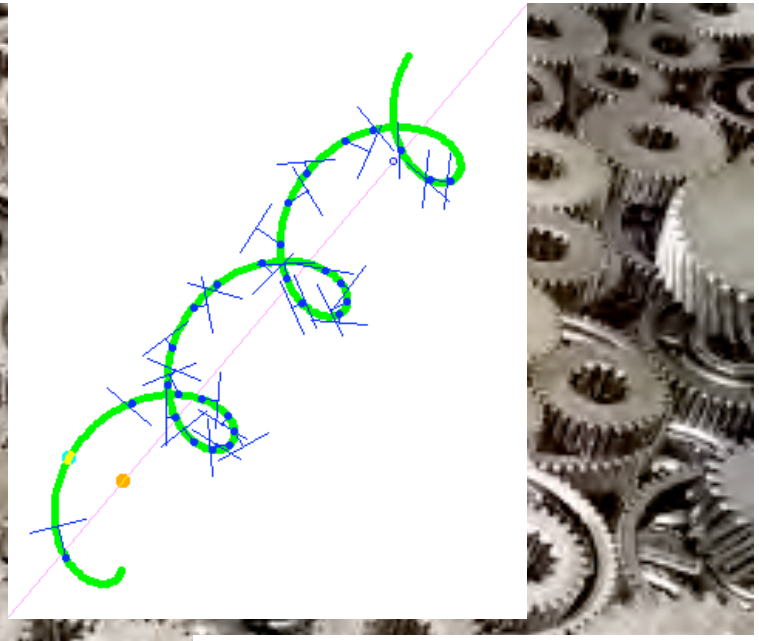
détection et fenêtrage à bord

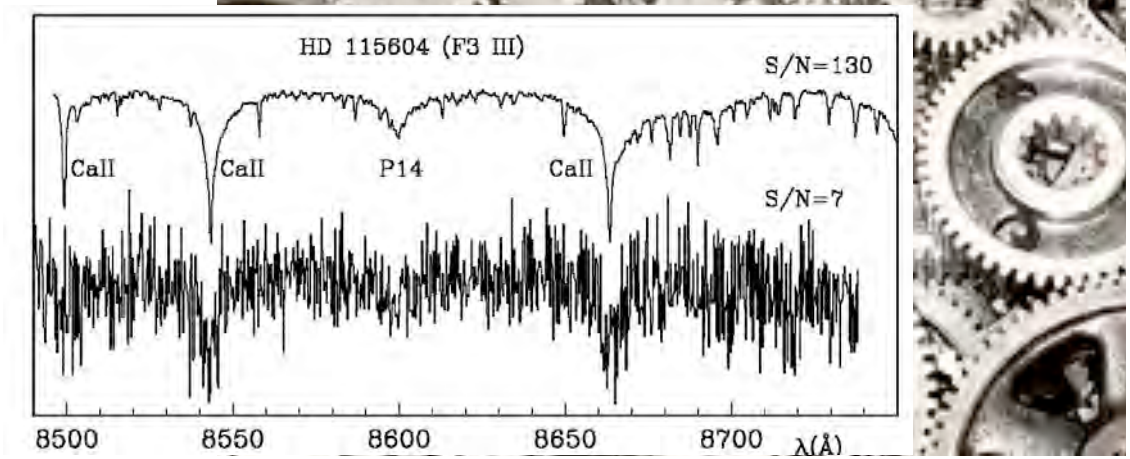
⇨

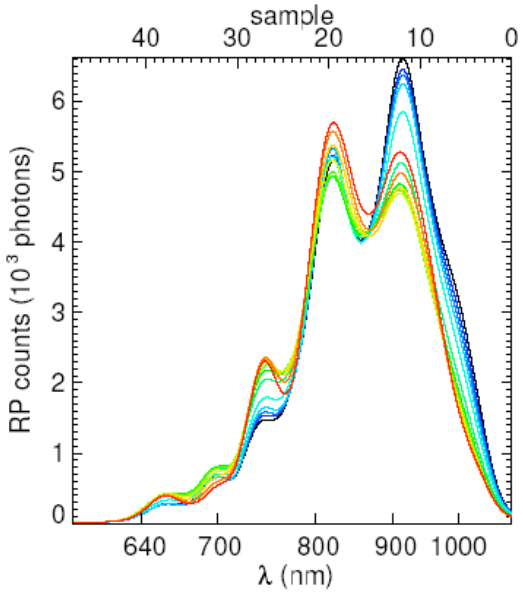
```
319255
 1486 19264 78012 15508 1269
 1781 23164 93825 18624 1553
 111 1624 6603 1302 110
 5 226 841 169 23
 1 37 134 24 4
3703 14461 63430 106228 64261
```

données envoyées au sol

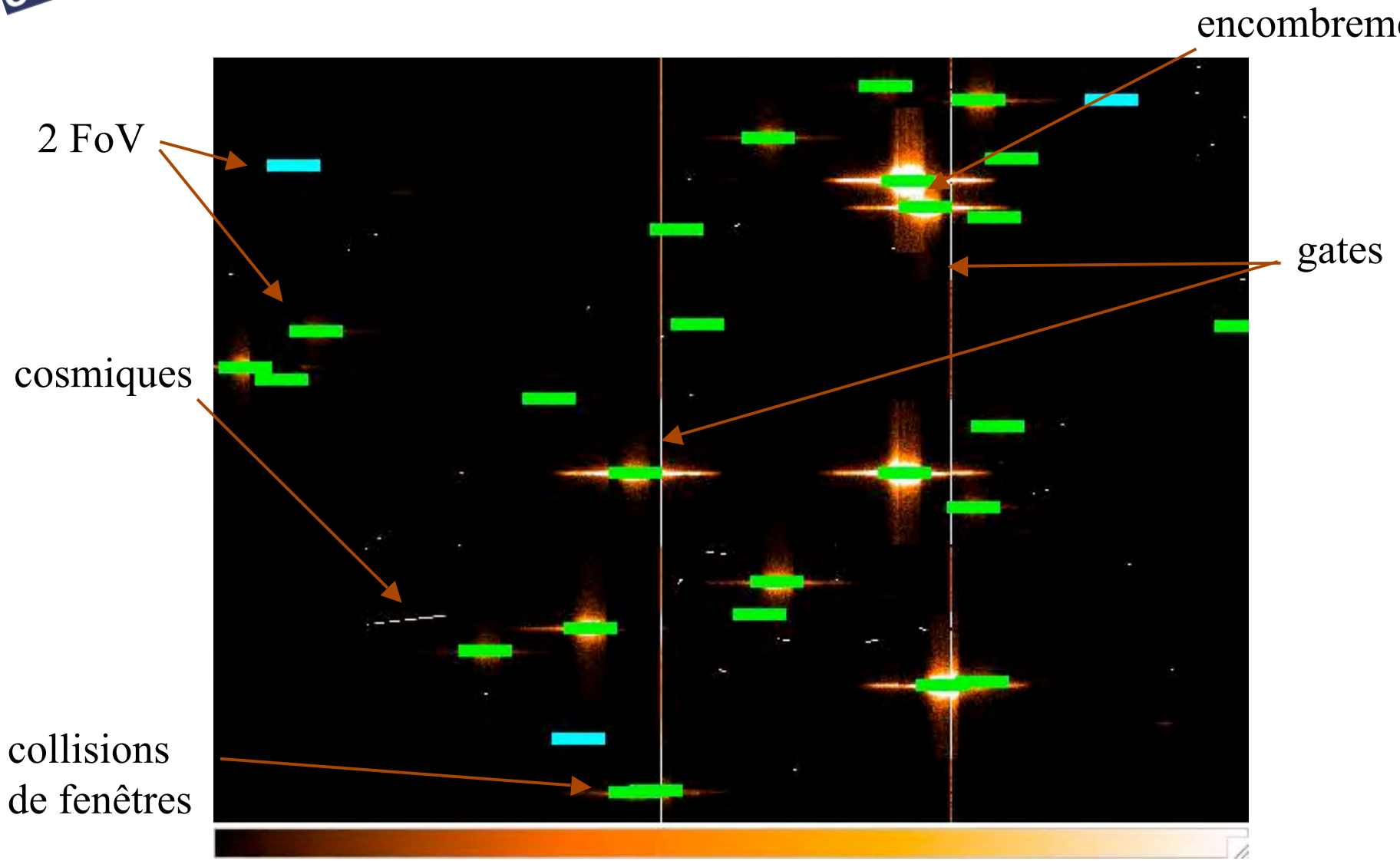
Gaia DPAC
Data Processing & Analysis Consortium





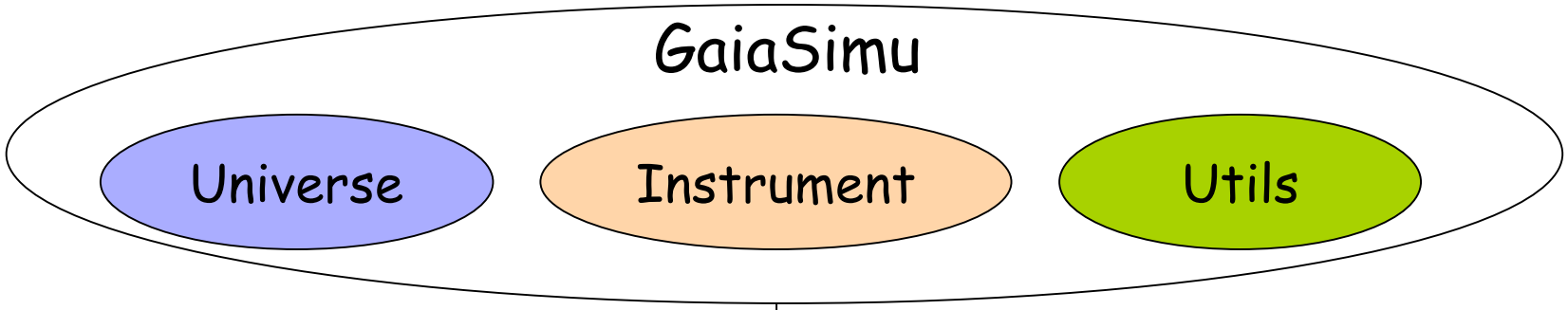



# Illustration…




RP observation de l'amas ouvert ngc6231

# Le Simulateur Gaia



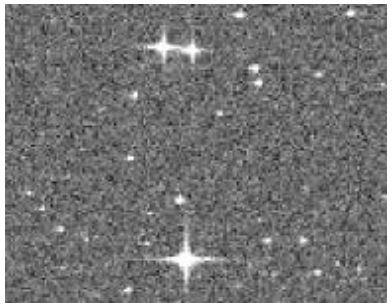

**GASS**

Telemetry

```
319255
 1486 19264 78012 15508 1269
 1781 23164 93825 18624 1553
 111 1624 6603 1302 110
 5 226 841 169 23
 1 37 134 24 4
3703 14461 63430 106228 64261
```

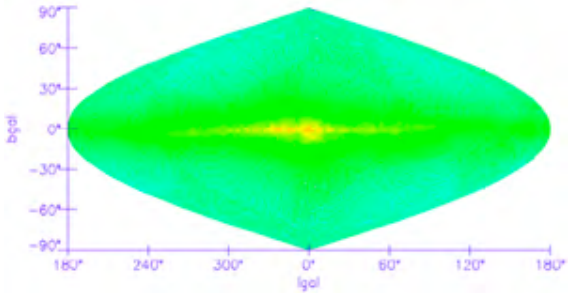
**GIBIS**

Pixel-level data



**GOG**

Gaia catalogue



# La participation française…

28 membres actifs (37%)

(co)-management de 6/8 DUs:

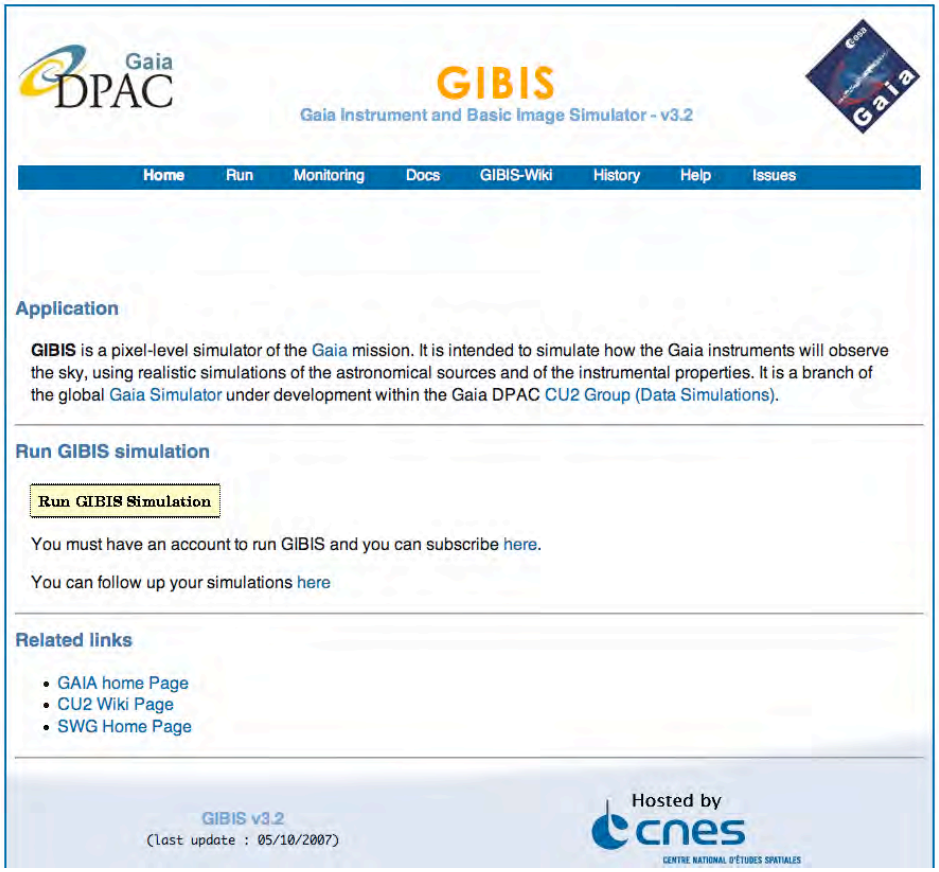
| | |
|---|---|
| • DU1: Management | X. Luri, C. Babusiaux *(Barcelone/Paris)* |
| • DU2: Software | J.M. Wallut *(CNES)* |
| • DU3: Modèle d'Univers | A. Robin *(Besançon)* |
| • DU4: Modèle d'Instrument | D. Gardiol *(Turin)* |
| • DU5: GASS | E. Masana *(Barcelone)* |
| • DU6: GIBIS | C. Babusiaux *(Paris)* |
| • DU7: GOG | X. Luri, C. Babusiaux *(Barcelone/Paris)* |
| • DU8: Validation | D. Egret *(Paris)* |

1/3 coordinateur technique:

| | |
|---|---|
| • Astrometry | C. Fabricius *(Barcelone)* |
| • Photometry | C. Jordi *(Barcelone)* |
| • Spectroscopy | P. Sartoretti *(Paris)* |

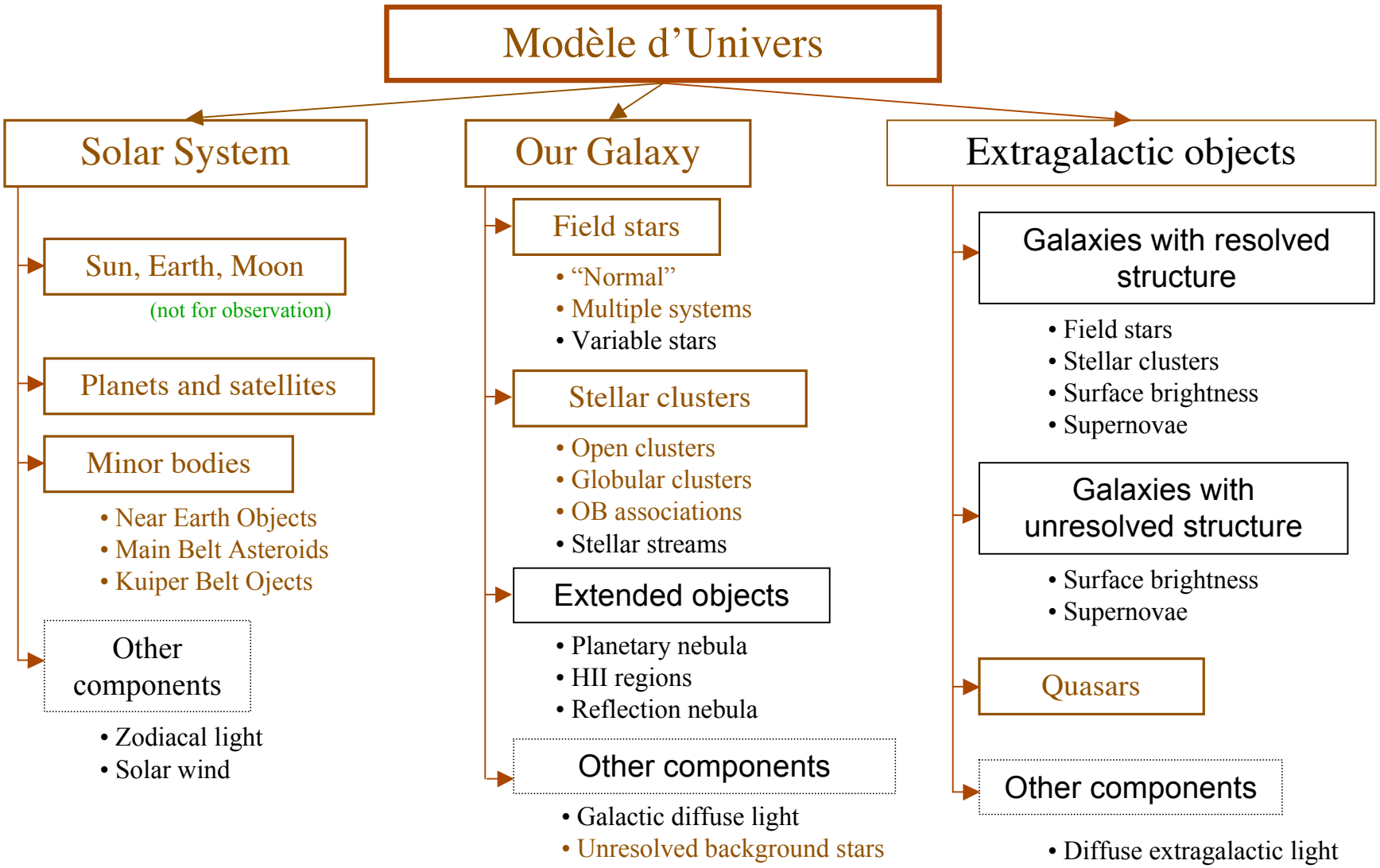
# Le CNES

- Coordinateur technique
- Déploiement des interfaces web de GIBIS et GOG au CNES




http://gibis.cnes.fr/

GOG soon on-line


Modèle d'Univers
Solar System
Sun, Earth, Moon
(not for observation)
Planets and satellites
Minor bodies
• Near Earth Objects
• Main Belt Asteroids
• Kuiper Belt Ojects
Other components
• Zodiacal light
• Solar wind
Our Galaxy
Field stars
• "Normal"
• Multiple systems
• Variable stars
Stellar clusters
• Open clusters
• Globular clusters
• OB associations
• Stellar streams
Extended objects
• Planetary nebula
• HII regions
• Reflection nebula
Other components
• Galactic diffuse light
• Unresolved background stars
Extragalactic objects
Galaxies with resolved structure
• Field stars
• Stellar clusters
• Surface brightness
• Supernovae
Galaxies with unresolved structure
• Surface brightness
• Supernovae
Quasars
Other components
• Diffuse extragalactic light

# Pour plus d'information…

http://www.rssd.esa.int/SA-general/Projects/GAIA/wiki/index.php?title=CU2:_Data_Simulations