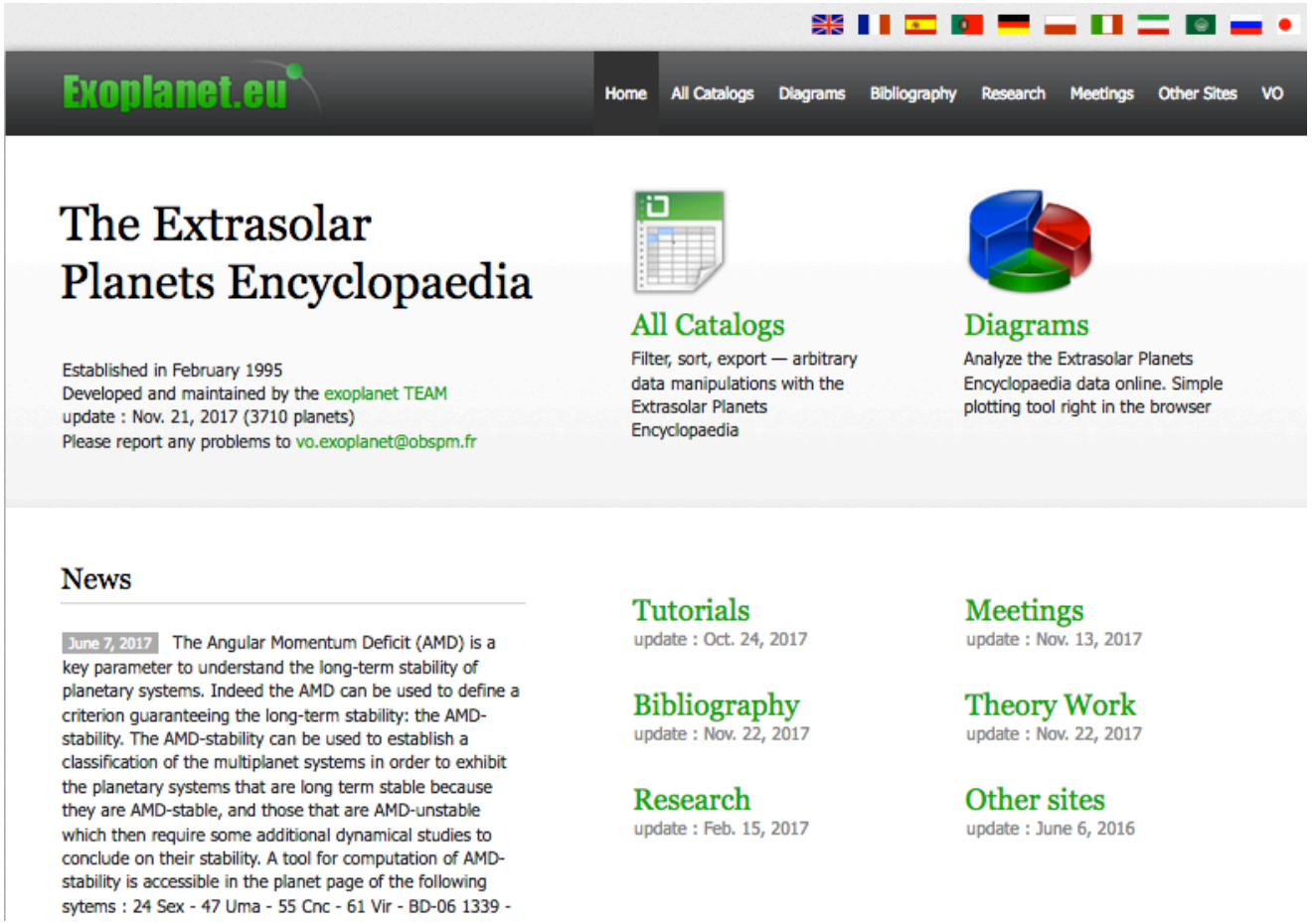
Encyclopédie des planètes extrasolaires

portail [*exoplanet.eu*](exoplanet.eu)

F. Roques



23 Novembre 2017 ***7e journée ESEP***

Encyclopédie des planètes extrasolaires

portail *exoplanet.eu*

- 1995 : Le portail a été créé par Jean Schneider (LUTH)
- 2012 : prise en charge par la DIO
- 2013 : Service National d'Observation de l'INSU.
- 2014 - : Equipe de Veille + Groupe Technique + Comité Editorial

l'Observatoire de Paris | LESIA

Laboratoire d'Études Spatiales et d'Instrumentation en Astrophysique

- base de données **des exoplanètes <u>publiées</u>** (3,700 planètes confirmées + 2,400 candidates) et des **étoiles** associées.

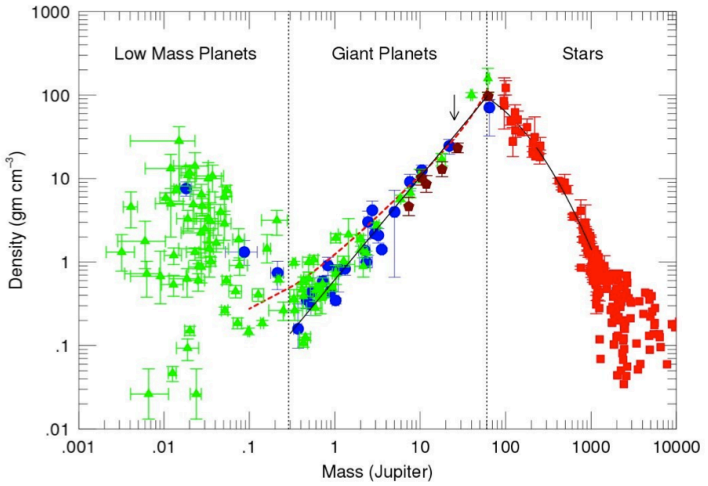
La borne supérieure des masses : 15 M_J, =>30 => **60 M_J**.

P**lanètes isolées** et **des systèmes planétaires sans étoile** => Reconfiguration de la base

28 paramètres par étoile et **54 paramètres par planète**

Nouveaux paramètres : atmosphère, disque

- **outils d'analyse : diagramme, histogramme, éphéméride** de visibilité, **indice de stabilité dynamique**
- **bibliographie** associée (17,100 titres)
- liste **des colloques**
- liste **des instruments** sol/espace
- liens avec les principaux **sites** du domaine.



Hatzes & Rauer, 2015

- **Responsable :** Françoise Roques (astronome, LESIA)

- **Groupe Technique :** C. Chauvin (PADC) **-** P. Le Sidaner (PADC **) -** M. Mancini (LUTH) + participation ponctuelle (ESEP)

- **Equipe de Veille :** J. Schneider (LUTH) **-** F. Roques (LESIA**) -** +participations ponctuelles (Europlanet) - Q. Kral

- **Comité Editorial** : R. Galicher (LESIA), M. Ollivier (IAS), S. Vinatier/ B. Charnay (LESIA), A. Lecavelier (IAP), D. Rouan (LESIA), D. Segransan (PlanetS)

VO CONNECTION OFF ON

Catalog

Download VOTable | CSV | DAT

Status Detection Filter

Showing 3710 planets / 2780 planetary systems / 621 multiple planet systems

Compact view

Show 100 entries

Planet Search Show / hide columns

Planet	Planet Status	Mass (M_{Jup})	Mass*sin(i) (M_{Jup})	Radius (R_{Jup})	Period (day)	a (AU)	e
HD 76920 b	Confirmed	3.93 (± 0.15)	3.93 (± 0.15)	—	415.4 (± 0.2)	1.149 (± 0.017)	0.856 (± 0.009)
Ross 128 b	Confirmed	0.0044 (± 0.00066)	0.0044 (± 0.00066)	—	9.8658 (± 0.007)	0.0496 (± 0.0017)	0.116 (± 0.097)
HD 113996 b	Confirmed	6.3 (± 1.0)	6.3 (± 1.0)	—	610.2 (± 3.8)	1.6 (± 0.1)	0.28 (± 0.12)
HD 111591 b	Confirmed	4.4 (± 0.4)	4.4 (± 0.4)	—	1056.4 (± 14.3)	2.5 (± 0.1)	0.26 (± 0.1)
HD 40956 b	Confirmed	2.7 (± 0.6)	2.7 (± 0.6)	—	578.6 (± 3.3)	1.4 (± 0.1)	0.24 (± 0.05)
1I/2017 U1	Confirmed	—	—	2e-06	—	—	1.196 (± 0.004)
HD 189733 b	Confirmed	1.142 ($_{-0.02515}^{+0.02516}$)	1.138 (± 0.025)	1.138 (± 0.077)	2.21857312 ($_{-7.6e-07}^{+7.6e-07}$)	0.03142 (± 0.00052)	0.0041 ($_{-0.002}^{+0.002}$) 85.5
K2-137 b	Confirmed	0.7 ($_{-nan}^{+0.0}$)	—	0.079 (± 0.008)	0.179715 (± 1e-06)	0.0058 (± 0.0006)	—
EPIC 246393474 b	Confirmed	0.0167 (± 0.0014)	—	0.137 (± 0.0089)	0.2803226 (± 1.3e-06)	—	0.0
GJ 9827 d	Confirmed	0.012 (± 0.0082)	—	0.186 (± 0.027)	6.201472 (± 0.00013)	0.0627 (± 0.005)	0.0
GJ 9827 c	Confirmed	0.0079 (± 0.0069)	—	0.115 (± 0.015)	3.648086 (± 0.0001)	0.044 (± 0.003)	—
GJ 9827 b	Confirmed	0.0258 (± 0.00481)	—	0.146 (± 0.0016)	1.2089819 (± 1.3e-05)	0.0211 (± 0.002)	0.0
HD 34445 g	Confirmed	0.38 (± 0.13)	0.38 (± 0.13)	—	5700.0 (± 1500.0)	6.36 (± 1.02)	0.032 (± 0.08)
HD 34445 f	Confirmed	0.119 (± 0.021)	0.119 (± 0.021)	—	676.8 (± 7.9)	1.543 (± 0.016)	0.031 ($_{-0.031}^{+0.057}$)
HD 34445 e	Confirmed	0.0529 (± 0.0089)	0.0529 (± 0.0089)	—	49.175 (± 0.045)	0.2687 (± 0.0019)	0.09 (± 0.062)
HD 34445 d	Confirmed	0.097 ($_{-0.037}^{+0.13}$)	0.097 ($_{-0.037}^{+0.13}$)	—	117.87 (± 0.18)	0.4817 (± 0.0033)	0.027 (± 0.051)
HD 34445 c	Confirmed	0.168 (± 0.016)	0.168 (± 0.016)	—	214.67 (± 0.45)	0.7181 (± 0.0049)	0.036 (± 0.071)
HD 34445 b	Confirmed	0.629 (± 0.028)	0.629 (± 0.028)	—	1056.7 (± 4.7)	2.075 (± 0.016)	0.014 (± 0.035)
WASP-156 b	Confirmed	0.128 ($_{-0.009}^{+0.01}$)	—	0.51 (± 0.02)	3.836169 (± 3e-06)	0.0453 (± 0.0009)	0.0 ($_{-0.0}^{+0.007}$) 8

Extrasolar Planets Bibliography

Exo-lightning radio emission: the case study of HAT-P-11b
HODOSAN G., HELLING Ch. & RIMMER P.
2017 | in Planetary, Solar and Heliospheric Radio Emissions (PRE 8) Grz Oct. 2016, , | arxiv
Update: Nov. 23, 2017

Planet-driven spiral arms in protoplanetary disks: I. Formation mechanism
BAE J. & ZHU ZH.
2017 | ApJ, submitted, | arxiv
Update: Nov. 23, 2017

Planet-driven spiral arms in protoplanetary disks: II. Implications
BAE J. & ZHU ZH.
2017 | ApJ, submitted, | arxiv
Update: Nov. 23, 2017

Modelling the atmospheric composition of warm exoplanets
VENOT O., DRUMMOND B. & MIGUEL Y.
2017 | Exp. Astron., submitted, | arxiv
Update: Nov. 23, 2017

Constraints on Super-Earths Interiors from Stellar Abundances
BRUGGER B., MOUSIS O., DELEUIL M. & DESCHAMPS F.
2017 | ApJ, 850, 93 | paper arxiv
Update: Nov. 22, 2017

KIC 8462852: Potential repeat of the Kepler day 1540 dip in August 2017
BOURNE R. & GARY B.
2017 | Res. Notes AAS, submitted, | arxiv

Planet 55 Cnc f

Name	55 Cnc f
Planet Status	Confirmed
Discovered in	2007
Mass	0.1479 ($^{+0.0000}_{-0.0000}$) M_J
Mass*sin(i)	0.1479 ($^{+0.0000}_{-0.0000}$) M_J
Semi-Major Axis	0.7733 (± 0.001) AU
Orbital Period	260.91 (± 0.38) JD
Eccentricity	0.08 ($^{+0.02}_{-0.02}$)
ω	139.0 (± 8.0) deg
T_{peri}	2453878.0 (± 5.0) JD
Radius	—
Inclination	—
Update	2017-08-11
Detection Method	Radial Velocity
Mass Detection Method	Radial Velocity
Radius Detection Method	—
Molecules	
Primary transit	—
Secondary transit	—
b	—
Impact Parameter b	—
Time V_r=0	—
Velocity Semiamplitude K	4.8 (± 0.2) m/s
Calculated temperature	—
Measured temperature	—
Hotbed point longitude	—
Geometric albedo	—
Surface gravity log(g/g$_\odot$)	—
Alternate Names	—

Star

55 Cnc

Name	55 Cnc
Distance	12.34 (± 0.4) pc
Spectral type	K0IV-V
Apparent magnitude V	5.95
Mass	0.905 (± 0.015) M_{Sun}
Age	10.2 (± 2.3) Gyr
Effective temperature	5196.0 (± 24.0) K
Radius	0.943 (± 0.01) R_{Sun}
Metallicity [Fe/H]	0.31 (± 0.04)
Detected Disc	—
Magnetic Field	—
RA J2000	08:52:37.0
Dec2000	+28:20:02
Alternate Names	
Planetary system	5 planets

More data

- Simbad
- Most recent references (ADS)

AMD-Stability Calculator for the System

Observability Predictor

Related publications

The LCES HIRES/Keck Precision Radial Velocity Exoplanet Survey
2009 BUTLER P., VOGT S., LAUGHLIN G., BURT J., RIVERA E. et al.
Astron. J., 153, 208
paper data

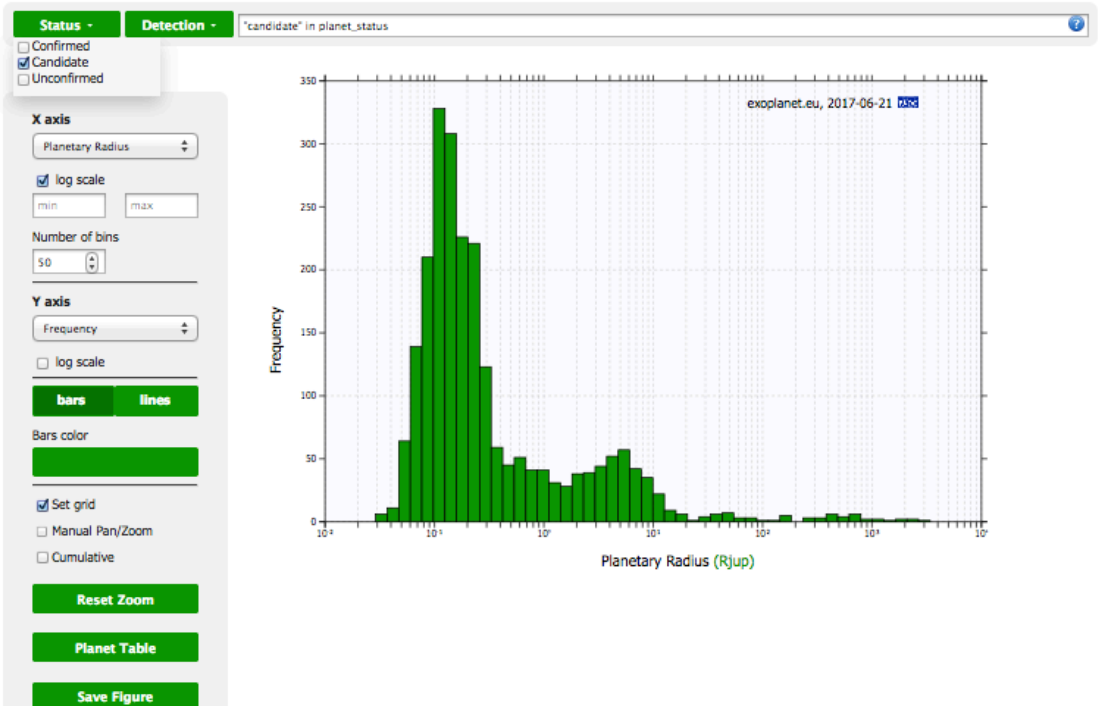
Feasibility of spectro-polarimetric characterization of exoplanetary atmospheres with direct observing instruments
2008 TAKAHASHI J., MATSUO T. & ITOH Y.
Astron. & Astrophys., 599, A56
paper

Diagrams: scatter plot

Histogram plot →

Diagrams: histogram plot

Scatter plot →



Observability Predictor 55 Cnc d

Parameters of the planet:

	value	min err	max err	
distance (d) :	12.34	0.4	0.4	pc
eccent (e) :	0.0269	0.0065	0.061	
inclin (I) :	30	0	0	°
omegaP (ωp) :	254.0	32.0	32.0	°
semiax (a) :	5.446	0.02	0.02	AU
Period (T) :	4867.0	26.0	25.0	day
tperi (tp) :	2453490.0	437.0	437.0	day
radiusP (Rp) :	0.091058632	0	0	Rjup
albedo_geo (A) :	0.367	0	0	
albedo_scat (ω) :	0.45	0	0	
longit (Ω) :	90	0	0	°

Observation period:

	min	max	steps	
fraction (f_T) :	0	1	100	
anomaly (v) :			50	°
date (t) :	YYYY-MM-DD	YYYY-MM-DD	50	JD

Update

Converter :

JD	< >	Day
JD	convert	YYYY-MM-DD

WARNING: For some variable which is not present in the database, the default value will be used.

Set Histogram

X axis

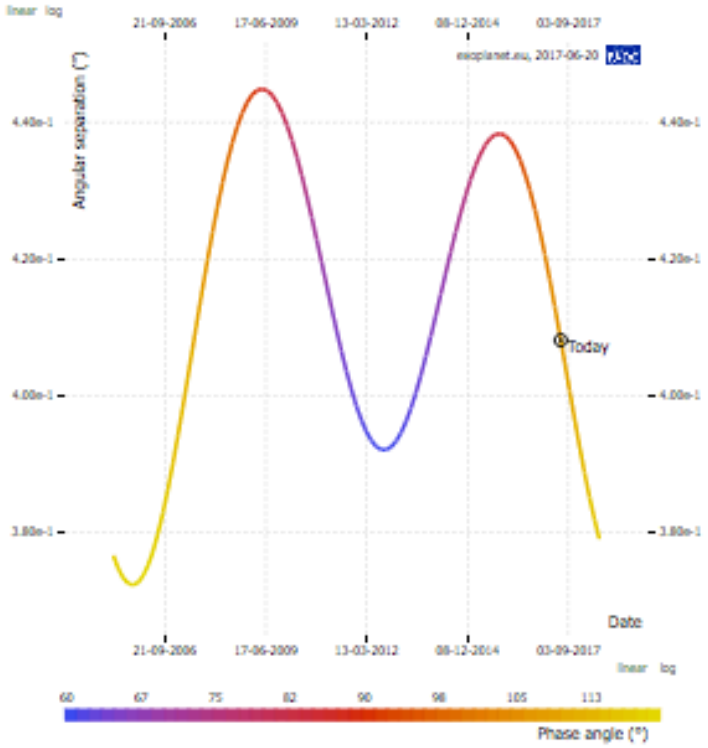
Date

True anomaly
Phase angle
Date
Orbital fraction
Angular separation
Separation
Star-planet distance
Polarization
Contrast Ratio
Polarized Contrast
Angle to the north

Save data

Save Figure

Restore Planet



AMDf-stability of the system 55 Cnc

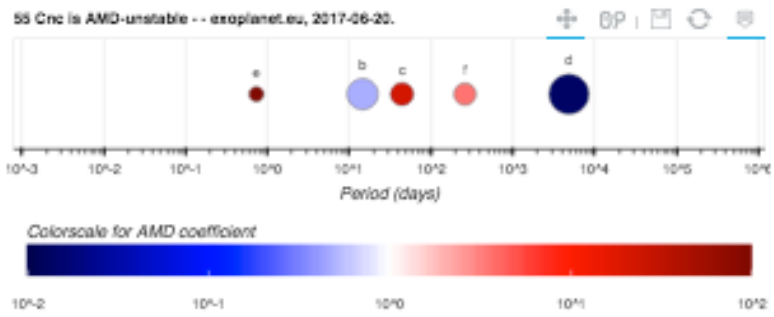
Parameters of the system:

	value	min err	max err	
55 Cnc e				
eccent (e) :	0.028	0.019	0.022	
mass (m) :	0.02547	0.00081	0.00089	MJup
period (T) :	0.7365478	1.2e-06	1.6e-06	day
55 Cnc b				
eccent (e) :	0.0023	0.0016	0.0025	
mass (m) :	0.84	0.031	0.23	MJup
period (T) :	14.65314	0.00095	0.0009	day
55 Cnc c				
eccent (e) :	0.072	0.014	0.013	
mass (m) :	0.1784	0.0078	0.0275	MJup
period (T) :	44.373	0.018	0.02	day
55 Cnc f				
eccent (e) :	0.08	0.057	0.102	
mass (m) :	0.1479	0.0093	0.0219	MJup
period (T) :	260.91	0.36	0.36	day
55 Cnc d				
eccent (e) :	0.0269	0.0065	0.061	
mass (m) :	3.86	0.15	0.6	MJup
period (T) :	4867.0	26.0	25.0	day

Update Graph

Set Errors to Zero

Restore System



Astronomy & Astrophysics manuscript no. 30022_hk_rev
March 15, 2017
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AMD-stability and the classification of planetary systems.

J. Laskar and A. Petit

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e-mail: laskar@imcce.fr

Accepted XXX. Received YYY; in original form ZZZ

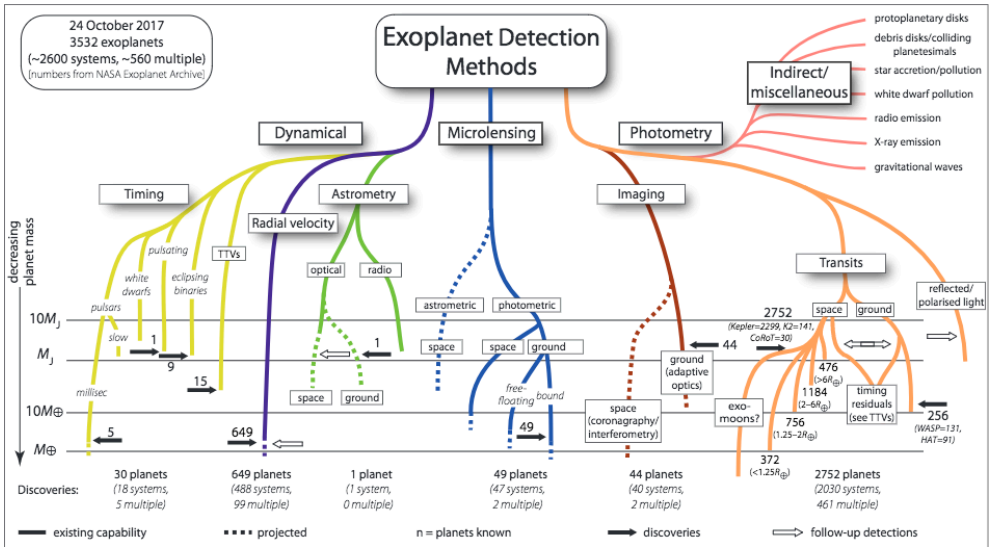
ABSTRACT

We present here in full detail the evolution of the angular momentum deficit (AMD) during collisions as it was described in (Laskar 2000). Since then, the AMD has been revealed to be a key parameter for the understanding of the outcome of planetary formation models. We define here the AMD-stability criterion that can be easily verified on a newly discovered planetary system. We show how AMD-stability can be used to establish a classification of the multiplanet systems in order to exhibit the planetary systems that are long-term stable because they are AMD-stable, and those that are AMD-unstable which then require some additional dynamical studies to conclude on their stability. The AMD-stability classification is applied to the 131 multiplanet systems from The Extrasolar Planet Encyclopaedia database (exoplanet.eu) for which the orbital elements are sufficiently well known.

http://exoplanet.eu/amdf/amd/55_cnc/

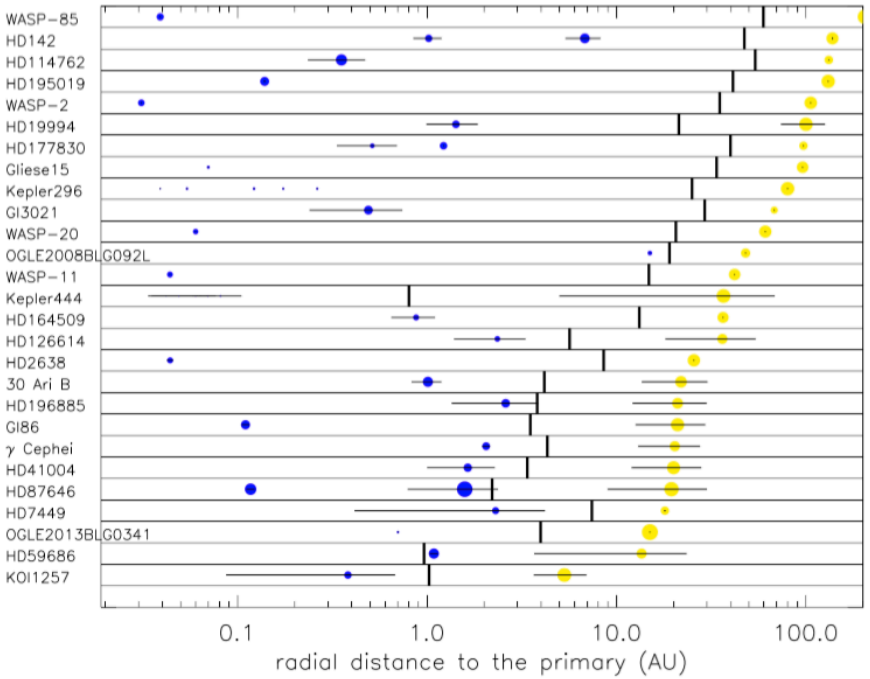
Figures synthétiques

Detection méthods



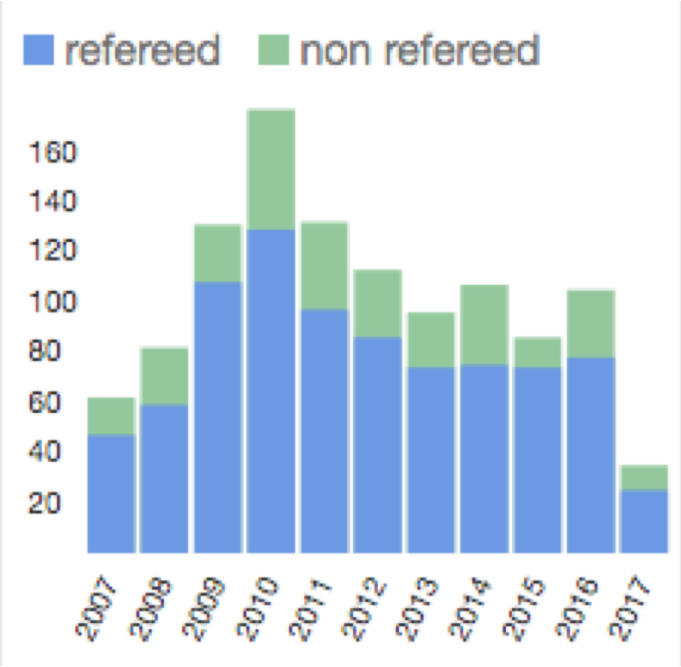
Perryman, 2017

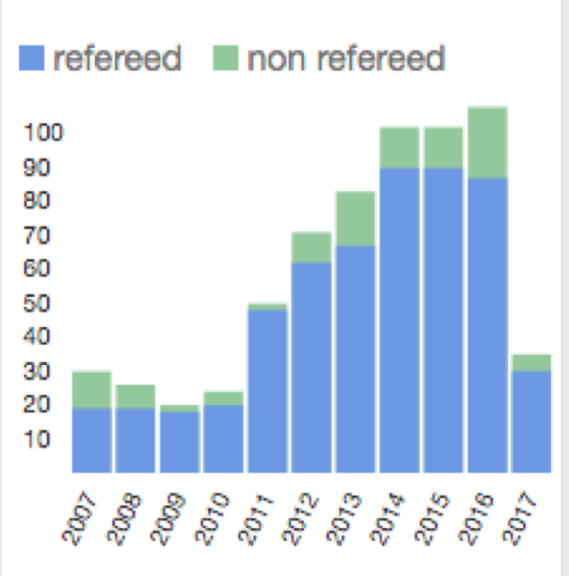
Binary planets
(en cours)

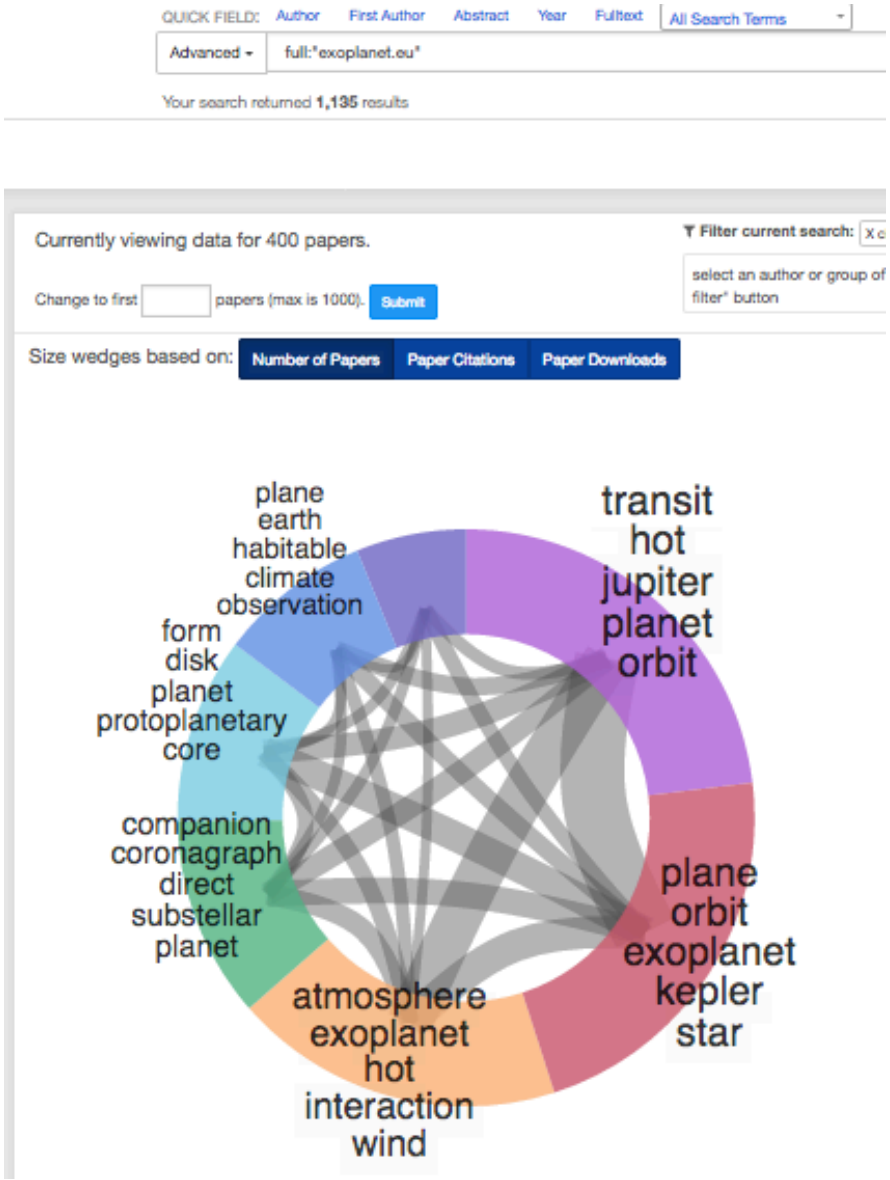


Thebault, 2017

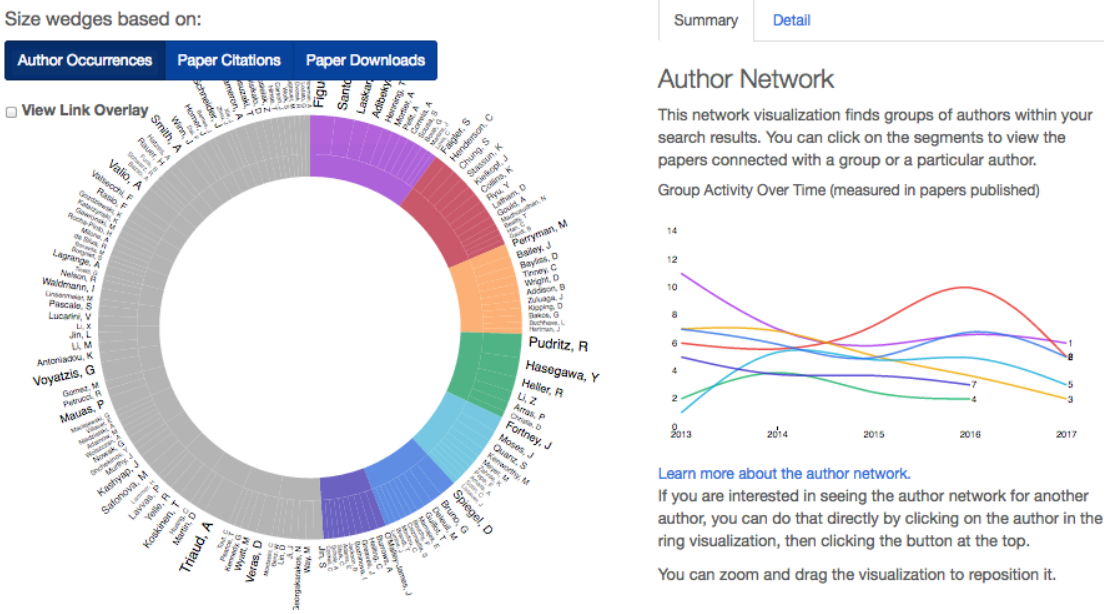
- Google :
- 30 000 connections par mois, 15 000 visiteurs différents par mois, 9 000 GO par mois, 200 pays (Google Analytics)
- Schneider et al. 2011 : cité 265 fois en 2013-2017
- 9380 fichiers (articles et présentations) citent exoplanet.eu
- ADS :
- 1185 articles citent *exoplanet.eu* (854 pour *exoplanets.org*) dont 905 articles à referee.

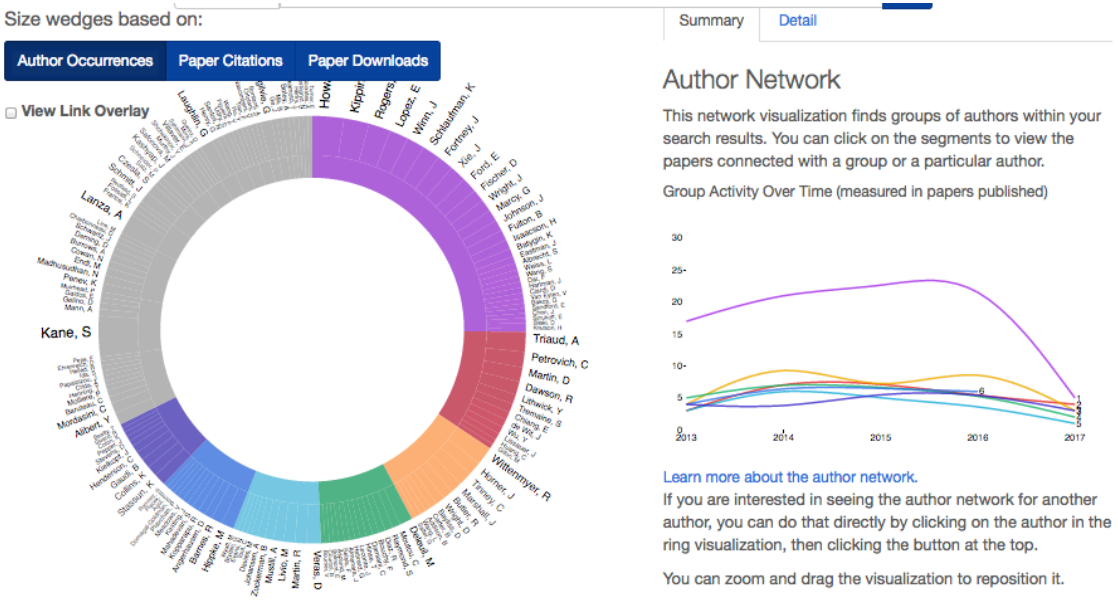




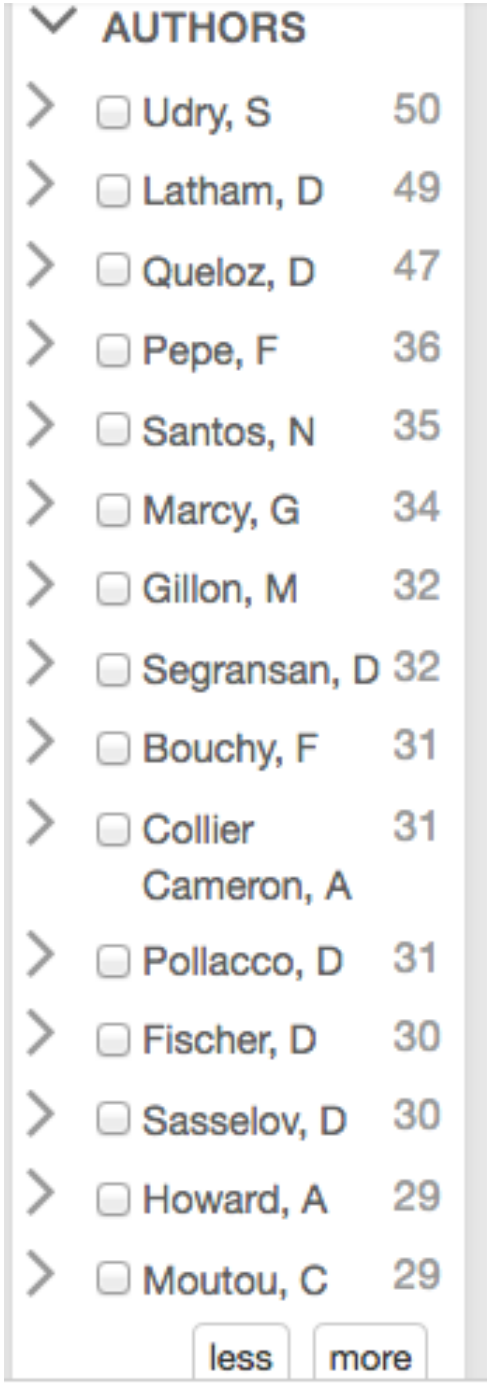


http://urlz.fr/5r1Z



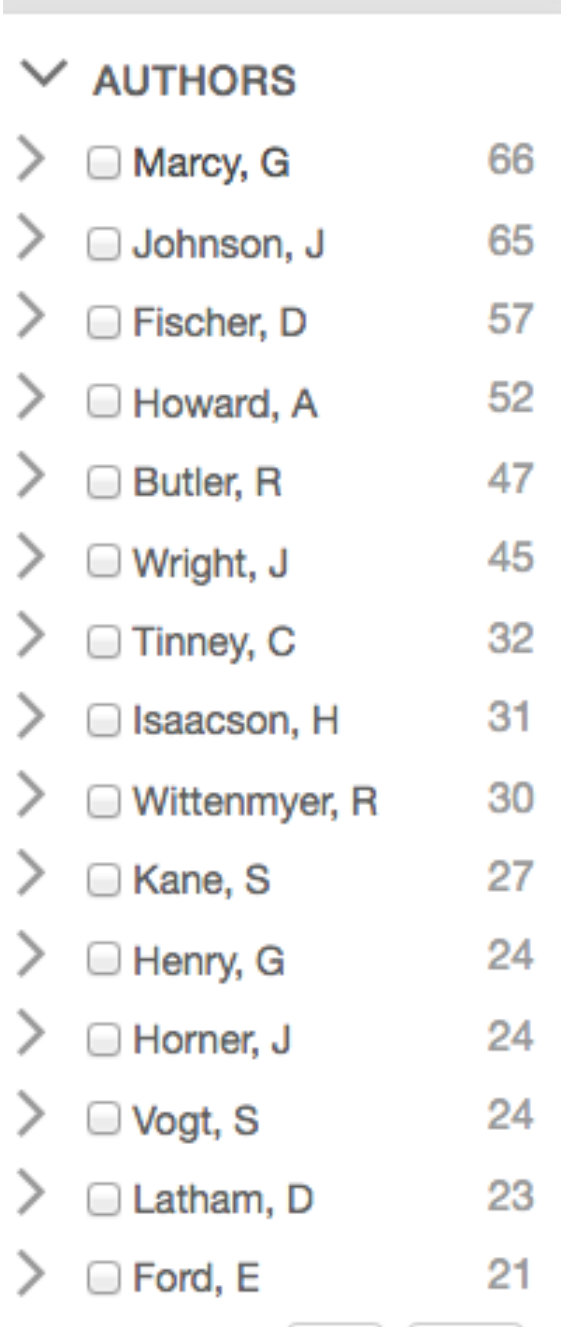


eu



http://urlz.fr/5qNv

org



Fonctions - Corrections

- Fonctionnalités sur le site d'administration (29)- Ergonomie (lecture automatique de données d'articles…) - Charte graphique
- Evolution de la base de données (planètes flottantes, planètes de binaires, précision, multiplicité des paramètres)

[Une étoile+n planètes] => [système : n étoiles + p planètes + anneaux + satellites + disques, …)

+ Sites pédagogiques, SESP, Exoplanètes

+ Outils évolués

Outils évolués

Pourquoi : Comparaison avec des observations, préparation d'observations, travail statistique sur des populations de planètes.

Comment : Proposer des résultats de simulations calculées en temps réels ou pré-calculées avec possibilité de jouer sur les valeurs des paramètres.

- **IMCCE** (Laskar, Hara, Petit) : AMD stability parameter – visualation d'orbites (intégrateur Laplace-Lagrange) – outil de traitement des données VR
- **LESIA-LMD** (Charnay, Bezard, Forget) : LMDZ : GCM 1D interactif - Exo-REM interactif/grilles précalculées et interpolation - géantes avec insolation (à plus long terme).

Prospective - 3
Outils évolués

- **LESIA** (Kral, Thebault) : DYCOSS-LIDT-DD (code hybride N-corps/collisions de simulation de disques) : cas type
- **LESIA-LAOG** (Kral, Augereau) : GRATER – calcul d'observables de disques de débris, flux, images, interférométrie – 10 paramètres, lien avec données iras, iso, herschel, wise, spitzer,akari => pages étoile, population, outil générique

L’Encyclopédie des Planètes Extrasolaires

=>

Encyclopédie des Systèmes Exoplanétaires

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merci