(Astronomy)

WRITING PHYSICS PAPERS 101

Publish or Perish

Jaroslav Fabian, ITF, Karl-Franzens University, Austria

WIKIPEDIA
The Free Encyclopedia

Publish or perish

From Wikipedia, the free encyclopedia

This article is about the concept in literature. For the Columbo episode, see List of Columbo episodes.

The examples and perspective in this article **deal primarily with the United States and do not represent a worldwide view of the subject**. Please improve this article and discuss the issue on the talk page. *(December 2010)*

"Publish or perish" refers to the pressure to publish work constantly to further or sustain a career in academia[1][2][3]. The competition for tenure-track faculty positions in academia puts increasing pressure on scholars to publish new work frequently[4].

Frequent publication is one of the few methods at a scholar's disposal to improve his or her visibility, and the attention that successful publications bring to scholars and their sponsoring institutions helps ensure steady progress through the field and continued funding. Scholars who focus on non-publishing-related activities (such as instructing undergraduates), or who publish too infrequently, may find themselves out of contention for available tenure-track positions.[*citation needed*]

A scholarly writer may experience pressure to publish constantly, regardless of the academic field in which the writer conducts scholarship. One physicist[*who?*], for example, sees evidence of shoddy scholarship in the field.[5] In the 1990s, graduate students and untenured assistant professors in the humanities and social sciences may have experienced more pressure than academics in the natural sciences, but after 2000, the pressure spread into other disciplines and the phenomenon came to influence the advancement of tenured associate professors to the coveted full professor title in the United States. Because of declining enrollments in MBA programs, business school professors are also significantly under pressure in the mid-2000s.

Contents [hide]

WHY ARE WE WRITING PAPERS?

- To communicate our original, interesting, and useful research
- To let others know what we are working on (and that we are working at all)
- To organize our thoughts
- To formulate our research in a comprehensible way
- To secure further funding
- To further our careers
- To make our publication lists look more impressive
- To have fun?
- Because we believe someone is going to read it!!!

Todas as anteriores !

Porém, para aluno de Doutoramento do Departamento de Astronomia do IAG.....

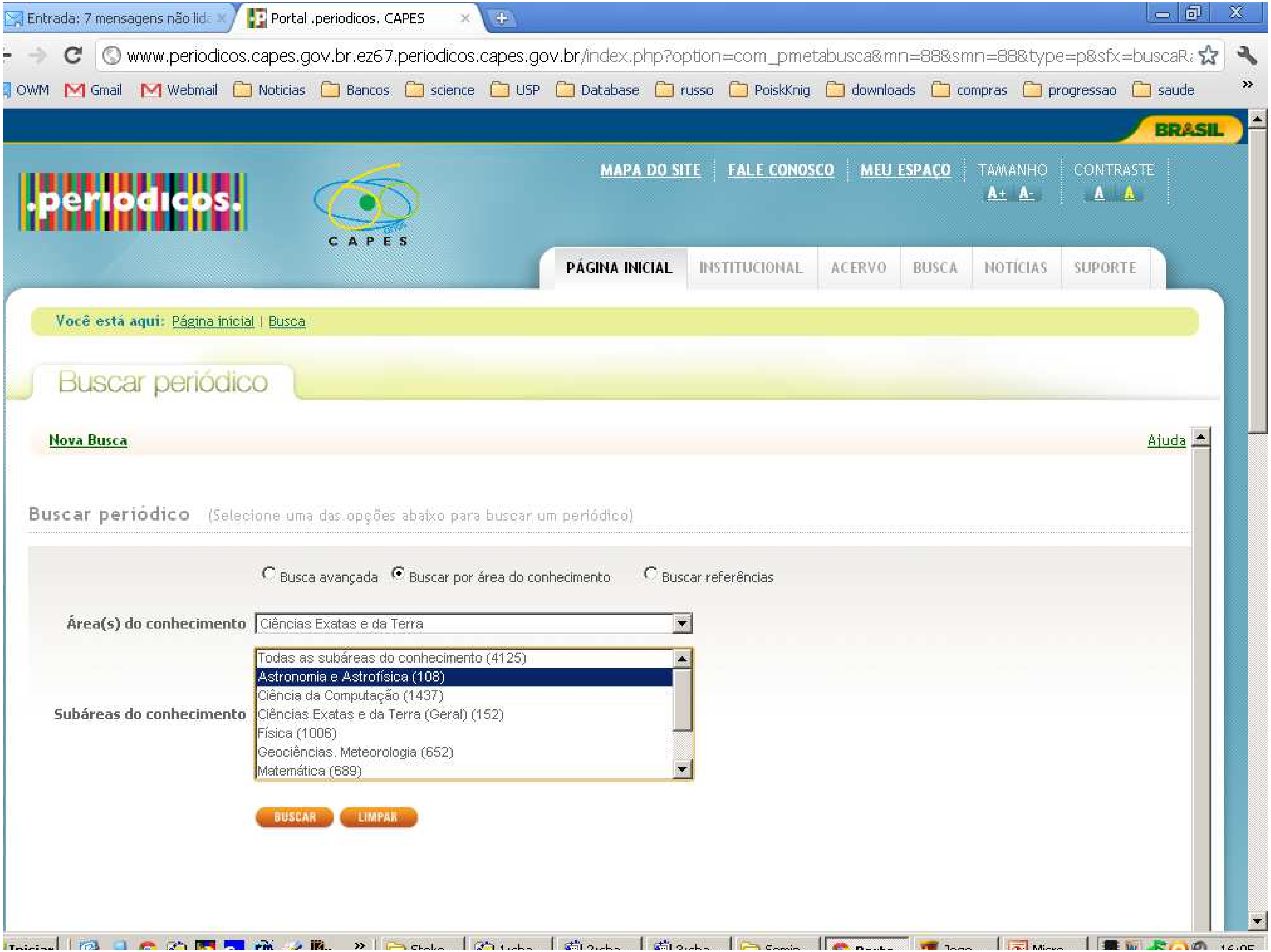
...publicar é uma obrigação!

(ASTRONOMY)

WHAT PHYSICS JOURNALS ARE THERE?

Hard-science journals
Physical Reviews series

- ✓ Physical Review A
  pra.aps.org
  atomic, molecular, and optical physics
- ✓ Physical Review B
  prb.aps.org
  condensed matter and materials physics
- ✓ Physical Review C
  prc.aps.org
  nuclear physics
- ✓ Physical Review D
  prd.aps.org
  particles, fields, gravitation and cosmology
- ✓ Physical Review E
  pre.aps.org
  statistical, nonlinear, and soft matter physics
- ✓ Physical Review Letters (PRL)
  prl.aps.org
  breakthroughs in all areas
- ✓ Reviews of Modern Physics
  rmp.aps.org
  reviews in all areas


Entrada: 7 mensagens não lid
Portal .periodicos. CAPES
www.periodicos.capes.gov.br.ez67.periodicos.capes.gov.br/index.php?option=com_pmetabusca&mn=88&smn=88&type=p&sfx=buscaR
OWM
Gmail
Webmail
Noticias
Bancos
science
USP
Database
russo
PoiskKnig
downloads
compras
progressao
saude
BRASIL
.periodicos.
CAPES
MAPA DO SITE
FALE CONOSCO
MEU ESPAÇO
TAMANHO
A+ A-
CONTRASTE
A A
PÁGINA INICIAL
INSTITUCIONAL
ACERVO
BUSCA
NOTÍCIAS
SUPORTE
Você está aqui: Página inicial | Busca
Buscar periódico
Nova Busca
Ajuda
Buscar periódico (Selecione uma das opções abaixo para buscar um periódico)
Busca avançada
Buscar por área do conhecimento
Buscar referências
Área(s) do conhecimento
Ciências Exatas e da Terra
Subáreas do conhecimento
Todas as subáreas do conhecimento (4125)
Astronomia e Astrofísica (108)
Ciência da Computação (1437)
Ciências Exatas e da Terra (Geral) (152)
Física (1006)
Geociências. Meteorologia (652)
Matemática (689)
BUSCAR
LIMPAR

Hard-science astronomical journals:

Astrobiology

The Astronomical Journal

The Astrophysical Journal

Astronomy and Astrophysics

Celestial Mechanics & Dynamical Astronomy

Earth and Planetary Science Letters

Journal of Cosmology and Astroparticle Physics

Icarus

Monthly Notices of the Royal Astronomical Society

Revista Mexicana de Astronomía y Astrofísica

Soft-science journals

- Physics Today
  www.physicstoday.org
  official journal of APS, good review articles and reseach news
- Physics World
  physicsweb.org
  Institute of Physics, good review articles
- Scientific American
  www.sciam.com
  popular science articles
- American Journal of Physics
  ojps.aip.org/ajp
  pedagogical physics research articles

Nature and Science

Nature

http://www.nature.com

Science

http://www.sciencemag.org

Em que revista eu devo submeter o meu paper?

Choosing a journal...

Impact Factors
how much is your article worth?

Institute for Scientific Information (ISI)

apps.webofknowledge.com

Roughly average citation per article

Impact factor calculation

The impact factor is a measure of the frequency with which the "average article" in a journal has been cited in a given period of time.

The impact factor for a journal is calculated based on a three-year period, and can be considered to be the average number of times published papers are cited up to two years after publication.

For example, the impact factor 2011 for a journal would be calculated as follows:

A = the number of times articles published in 2009-2010 were cited in indexed journals during 2011

B = the number of articles, reviews, proceedings or notes published in 2009-2010

impact factor 2011 = A/B

ISI 2012 impact factors :

Astrobiology 2.150

The Astronomical Journal 4.035

The Astrophysical Journal 6.024

Astronomy and Astrophysics 4.587

Celestial Mechanics & Dynamical Astronomy 2.319

Earth and Planetary Science Letters 4.180

Journal of Cosmology and Astroparticle Physics 5.723

Icarus 3.385

Monthly Notices of the Royal Astronomical Society 4.900

Revista Mexicana de Astronomía y Astrofísica 1.000

ISI 2012 impact factors :

Nature 36.280
Science 31.360

Citations
how much is your article really worth?

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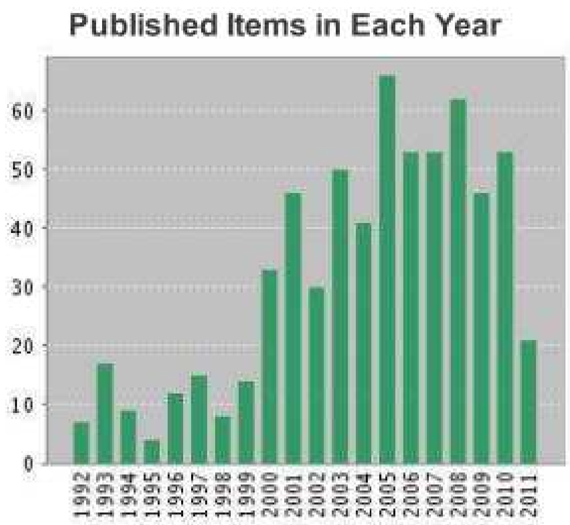
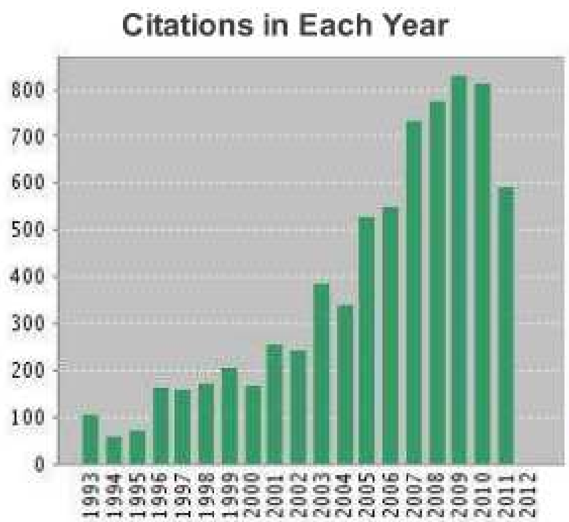
ISI Web of KNOWLEDGE
Transforming Research



The latest 20 years are displayed.
View a graph with all years.



The latest 20 years are displayed.
View a graph with all years.

Results found: 672

Sum of the Times Cited [?] : 7392

Sum of Times Cited without self-citations [?] : 6646

Citing Articles[?] : 5109

View Citing Articles
View without self-citations

Average Citations per Item [?] : 11.00

h-index [?] : 41

Preprint Archives
free, fast, referee free

www.arxiv.org

xxx.lanl.org

Como é um paper?

(propriedades básicas de um paper)

STRUCTURE OF A PHYSICS ARTICLE

Short letters

Nature
Science

rapid communications, …

1-4 pages

- Title
- Abstract
- Homogeneous body includes introduction and acknowledgments
- 0-4 figures
- At most paragraph titles

Regular articles
4-500 pages

- Title
- Abstract
- Introduction
- Body sections
- Conclusions/Summary
- Acknowledgments
- References
- Appendices

Title

informative, catchy, concise

'visible': key words are essential to localize your paper using searching software

(http://scholar.google.com.br/)

Title: concise

Asociación Argentina de Astronomía
Third La Plata International School on Astronomy and Geophysics:
Chaos, diffusion and non–integrability in Hamiltonian Systems
Applications to Astronomy, 2011
P. M. Cincotta, C. M. Giordano & C. Efthymiopoulos, eds.

The planetary 2/1 mean-motion resonance

T.A. Michtchenko, S. Ferraz-Mello

Instituto de Astronomia, Geofísica e Ciências Atmosféricas, USP, São Paulo, Brazil

Abstract. We present the dynamical structure of the phase space of the planar planetary 2/1 mean-motion resonance (MMR). Inside the resonant domain, there exist two families of periodic orbits, one associated to the librational motion of the critical angle (σ-family) and the other related to the circulatory motion of the angle between the pericentres ($\Delta\varpi$-family). The well-known apsidal corotation resonances (ACR) appear at the intersections of these families. A complex web of secondary resonances exists also for low eccentricities, whose strengths and positions are dependent on the individual masses and spatial scale

Title: informative

Asociación Argentina de Astronomía
Third La Plata International School on Astronomy and Geophysics:
Chaos, diffusion and non–integrability in Hamiltonian Systems
Applications to Astronomy, 2011
P. M. Cincotta, C. M. Giordano & C. Efthymiopoulos, eds.

The periodic and chaotic regimes of motion in the planetary 2/1 mean-motion resonance

T.A. Michtchenko, S. Ferraz-Mello

Instituto de Astronomia, Geofísica e Ciências Atmosféricas, USP, São Paulo, Brazil

Abstract. We present the dynamical structure of the phase space of the planar planetary 2/1 mean-motion resonance (MMR). Inside the resonant domain, there exist two families of periodic orbits, one associated to the librational motion of the critical angle (σ-family) and the other related to the circulatory motion of the angle between the pericentres ($\Delta\varpi$-family). The well-known apsidal corotation resonances (ACR) appear at the intersections of these families. A complex web of secondary resonances exists also for low eccentricities, whose strengths and positions are dependent on the individual masses and spatial scale

Title: catchy ('visible')

Asociación Argentina de Astronomía
Third La Plata International School on Astronomy and Geophysics:
Chaos, diffusion and non–integrability in Hamiltonian Systems
Applications to Astronomy, 2011
P. M. Cincotta, C. M. Giordano & C. Efthymiopoulos, eds.

The periodic and chaotic regimes of motion in the exoplanet 2/1 mean-motion resonance

T.A. Michtchenko, S. Ferraz-Mello

Instituto de Astronomia, Geofísica e Ciências Atmosféricas, USP, São Paulo, Brazil

Abstract. We present the dynamical structure of the phase space of the planar planetary 2/1 mean-motion resonance (MMR). Inside the resonant domain, there exist two families of periodic orbits, one associated to the librational motion of the critical angle (σ-family) and the other related to the circulatory motion of the angle between the pericentres ($\Delta\varpi$-family). The well-known apsidal corotation resonances (ACR) appear at the intersections of these families. A complex web of secondary resonances exists also for low eccentricities, whose strengths and positions are dependent on the individual masses and spatial scale

Abstract

concise, direct, informative

Abstracts are now more important than ever due to the increasing large number of articles.

One cannot read all the papers in each issue of A&A, not even in ones own field.

Abstracts should state major findings, even some specifics (numbers, formulas showing basic trends).

Astronomy & Astrophysics manuscript no. hd200964-revised-2c
September 24, 2014

Formation and evolution of the two 4/3 resonant giants planets in HD 200946

M. Tadeu dos Santos⋆, J. A. Correa-Otto⋆⋆, T. A. Michtchenko, and S. Ferraz-Mello

Instituto de Astronomia, Geofísica e Ciências Atmosféricas, USP, Rua do Matão 1226, 05508-090 São Paulo, Brazil

ABSTRACT

Context. HD 200964 is suggested to be the first exoplanetary system with two Jovian planets evolving in the 4/3 mean-motion resonance. Previous scenarios to simulate the formation of two giant planets in the stable 4/3 resonance configuration have failed. Moreover, the orbital parameters available in the literature point out to an unstable configuration of the planetary pair.

Aims. The purpose of this paper is: i) to determine the orbits of the planets from the RV measurements for the updated value of the stellar mass (1.57 $M_{\odot}$), ii) to analyze the stability of the planetary evolution in the vicinity and inside the 4/3 MMR, and iii) to elaborate a possible scenario of the formation for systems in the 4/3 MMR.

Methods. We use the model by Correa-Otto et al. (2013) to simulate the formation of the stable planetary pair trapped inside the 4/3 resonance. Our scenario includes an interaction between the type I and type II of migration, planetary growth and stellar evolution from the main sequence to the sub-giant branch. The re-determination of the orbits is done using a Biased Monte Carlo procedure, while the planetary dynamics is studied using numerical tools, such as dynamical maps and dynamical power spectra.

Results. The outcomes of the formation simulations are able to very closely reproduce the 4/3 resonant dynamics of the best-fit configuration obtained in this paper. Moreover, the confidence interval of the fit matches well with the very narrow stable region of the 4/3 mean-motion resonance.

Conclusions. The formation process of the HD 200964 system is very sensitive to the planetary masses and protoplanetary disk parameters. In fact, only a thin and flat disk allows the embryo-sized planets to reach the 4/3 resonant configuration. The stable evolution of the resonant planets is also sensitive to the mass of the central star, due to overlapping high-order resonances inside the 4/3 resonance. Regardless of the very narrow domain of stable motion, the confidence interval of our fit is statistically close to the stability area.

Key words. Planetary Systems – Planets and Satellites: formation – Planets and Satellites: dynamical evolution and stability – Methods: numerical

Introduction

- Give the first impression about the paper
- Place the work into broader context
- Relate to other relevant research
- Say why is the work important, in plain language
- State major achievements/limitations
- State techniques/methods
- Describe organization of the paper

Introduction

- Give the first impression about the paper
- Place the work into broader context
- Relate to other relevant research
- Say why is the work important, in plain language
- State major achievements/limitations
- State techniques/methods
- Describe organization of the paper

linguagem clara

Example of language:

a) A mais B é igual a C

b) A é igual a C se somar B a A

J. F. Press

Introduction

- Give the first impression about the paper
- Place the work into broader context
- Relate to other relevant research
- Say why is the work important, in plain language
- State major achievements/limitations
- State techniques/methods
- Describe organization of the paper

Body of the paper

Describe your findings in an organized, structured, and logical way

- Think about the organization ahead of actual writing
- Create informative headings helping easy orientation

Conclusions

- Give your article closure
- Summary of major results … and their limitations
- Prospects for future extensions
- Possible applications, relevance to other works, fields

Acknowledgments

This work was supported by the São Paulo State Science Foundation, FAPESP, and the Brazilian National Research Council, CNPq. This work has made use of the facilities of the Computation Center of the University of São Paulo (LCCA-USP) and of the Laboratory of Astroinformatics (IAG/USP, NAT/Unicsul), whose purchase was made possible by the Brazilian agency FAPESP (grant 2009/54006-4) and the INCT-A. **The authors are grateful to the anonymous referee for numerous suggestions and correction to this paper.**

References

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[] Andrews, S. M. & Williams, J. P. 2005, ApJ, 631, 1134
[] Armitage, P. J. 2010, Astrophysics of Planet Formation (Cambridge, UK: Cambridge University Press)
[] Beaugé, C. & Ferraz-Mello S. 1993, Icarus, 103, 301

Oh, e agora, quem poderá me ajudar?!!!

nature International weekly journal of science

NATURE | NEWS

Publishers withdraw more than 120 gibberish papers

Conference proceedings removed from subscription databases after scientist reveals that they were computer-generated.

Richard Van Noorden

24 February 2014 | Updated: 25 February 2014

The publishers Springer and IEEE are removing more than 120 papers from their subscription services after a French researcher discovered that the works were computer-generated nonsense.

Over the past two years, computer scientist Cyril Labbé of Joseph Fourier University in Grenoble, France, has catalogued computer-generated papers that made it into more than 30 published conference proceedings between 2008 and 2013. Sixteen appeared in publications by Springer, which is headquartered in Heidelberg, Germany, and more than 100 were published by the Institute of Electrical and Electronic Engineers (IEEE), based in New York. Both publishers, which were privately

Top Story

Brains of Norway

Edvard and May-Britt Moser are passionate about the brain. That passion has now been rewarded with a Nobel prize for their work on how our brains know where we are.

LaTeX 101

text, equations, figures, tables, references

template for PRL

```
\documentclass[aps,prl,floatfix,twocolumn,footinbib]{revtex4}
\usepackage{epsfig}
\begin{document}

\title{Template}
\author{Jaroslav Fabian}
\affiliation{Institute for Theoretical Physics, Karl-Franzens
University, Universit\"atsplatz 5, 8010 Graz, Austria}
\author{Albert Newton}
\affiliation{Center for extraterrestrial research, Washington DC}
\begin{abstract}
A LateX template is provided to generate physics papers fast and
easy.
\end{abstract}\maketitle
```

inserting figures

```
\begin{figure}
\centerline{\psfig{file=fig.eps, width=1\linewidth}}
\caption{Template figure. Put your caption here}
\label{fig:1}
\end{figure}
```

writing equations

To place equations in line write $s_x=a+b$. Symbol \$ separates the math format.

This is how single equations are written between lines:

```
\begin{equation}
\delta s=\int_0^1
\gamma_{2,be}\cosh(w_b/L_{nb})s_{0b}\exp(qV_{be}/k_BT)dq.
\end{equation}
```

This is how multiple equations are written:

```
\begin{eqnarray} \label{eq:2}
a&=&\sum_{i=1}^{\infty}, \\
b&=&\log(x).
\end{eqnarray}
```

sections

```
\section{\label{sec:Intro} Introduction}
  In this section …

\section{\label{sec:model} Model}
We discuss the model introduced in Sec. \ref{sec:Intro}. The details
are shown
In Fig. \ref{fig:1}. Our work is published in Ref.
\cite{Newton2000:PRL}.
```

references

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\bibliographystyle{apsrev}
\bibliography{references}
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Separate file reference.bib contains references in the following format:

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    title  = "On falling apples",
    journal= "Phys. Rev. Lett.",
    volume =  "00",
    year   =  "2000",
    pages  =  "1-5"
}
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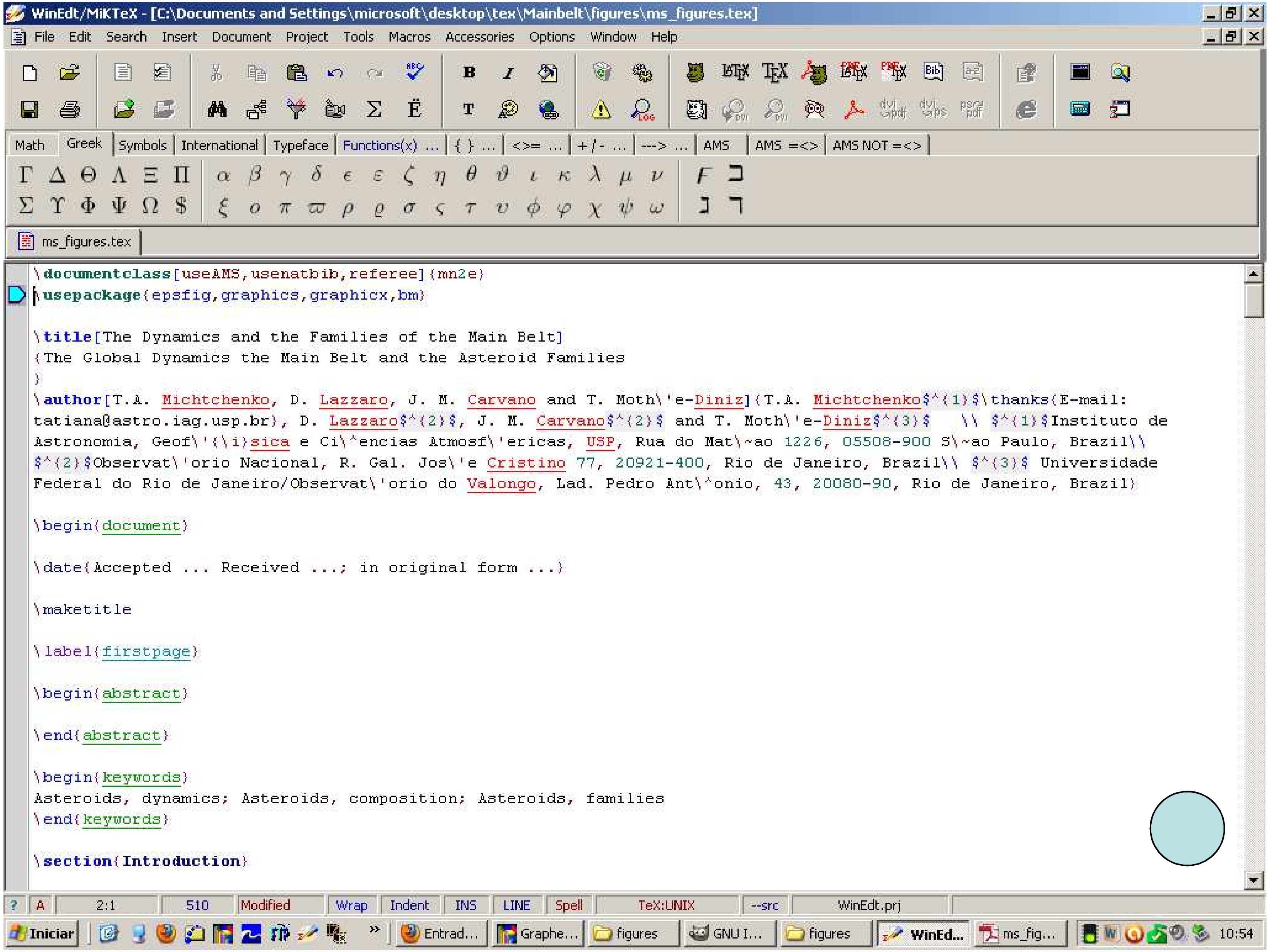
WinEdt/MiKTeX - [C:\Documents and Settings\microsoft\desktop\tex\Mainbelt\figures\ms_figures.tex]
File Edit Search Insert Document Project Tools Macros Accessories Options Window Help
Math Greek Symbols International Typeface Functions(x) ... { } ... <>= ... +/- ... ---> ... AMS AMS =<> AMS NOT =<>
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{The Global Dynamics the Main Belt and the Asteroid Families
}
\author[T.A. Michtchenko, D. Lazzaro, J. M. Carvano and T. Moth\'e-Diniz]{T.A. Michtchenko^{1}\thanks{E-mail:
tatiana@astro.iag.usp.br}, D. Lazzaro^{2}, J. M. Carvano^{2} and T. Moth\'e-Diniz^{3} \\ ^{1}Instituto de
Astronomia, Geof\'{\i}sica e Ci\^encias Atmosf\'ericas, USP, Rua do Mat\~ao 1226, 05508-900 S\~ao Paulo, Brazil\\
^{2}Observat\'orio Nacional, R. Gal. Jos\'e Cristino 77, 20921-400, Rio de Janeiro, Brazil\\ ^{3} Universidade
Federal do Rio de Janeiro/Observat\'orio do Valongo, Lad. Pedro Ant\^onio, 43, 20080-90, Rio de Janeiro, Brazil}
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\end{abstract}
\begin{keywords}
Asteroids, dynamics; Asteroids, composition; Asteroids, families
\end{keywords}
\section{Introduction}
2:1 510 Modified Wrap Indent INS LINE Spell TeX:UNIX --src WinEdt.prj
Iniciar Entrad... Graphe... figures GNU I... figures WinEd... ms_fig... 10:54

finish

\end{document}

Compiling LaTex

- latex paper.tex % compile the file
- bibtex paper.tex % compile references (if.bib) exists
- latex paper.tex % compile again
- latex paper.tex % compile yet again
- dvips paper.dvi % create a .ps file
- gv paper.ps % view the .ps file

Astronomy & Astrophysics manuscript no. hd200964-revised-2c
September 27, 2014

Formation and evolution of the two 4/3 resonant giants planets in HD 200946

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Key words. Planetary Systems – Planets and Satellites: formation – Planets and Satellites: dynamical evolution and stability – Methods: numerical

1. Introduction

HD 200964 is the first discovered system with two giant planets suggested to evolve inside the 4/3 mean-motion resonance (Johnson et al. 2011). The planets revolve around a sub-giant K-type star with estimated lifetime 3 Gyr and mass 1.57 $M_\odot$, according to the recent estimate given by Mortier et al. (2013). The determination of the planetary orbits was done using the 61 Lick and 35 Keck radial velocity measurements (RV) and the dynamical behaviour of the system in the domain around the nominal best-fit solution was analyzed over 10 Myr by Johnson et al. (2011). The results have shown that the current observations strongly favor orbital solutions in or close to the 4/3 mean-motion resonance (MMR).

Wittenmyer et al. (2012) have extended over 100 Myr the analysis of stability of the HD 200964 system mapping the neighborhood of the solution proposed by Johnson et al. (2011). Their results have confirmed that the long-living planetary pair of giants is only possible if the planets are currently trapped inside the mutual 4/3 MMR. However, none from the 4/3 resonant configurations tested in their simulations has survived over 100 Myr. Regardless of the very long extension of the tested timespan, it is still one order less than the lifetime of the central star. This fact raises a question whether a system composed of such close Jupiter-sized planets, evolving on mutually crossing orbits, is reliable.

The origin of the HD 200964 system is another unsolved problem. The issue was extensively explored in Rein et al. (2012), where the model of formation of planetary pairs in the 4/3 MMR based on the traditional type II migration scenario was investigated. However, even employing non-conventional scenarios, such as formation 'in situ' and planetary 'scattering', these attempts to simulate the formation of two giant planets in the stable 4/3 resonance configuration have failed.

It is clear that the inherent problems described above require a new approach in the study of formation and evolution of such close and massive planetary systems as the HD 200964 system. In this paper, we introduce the approach whose principal components are i) the re-determination of the orbits of the planets in the HD 200964 system from the RV measurements, ii) the complete comprehension of the planetary evolution in the vicinity and inside the 4/3 MMR, and iii) the elaboration of a possible scenario of the formation of systems in the 4/3 MMR. We show that only the joint consideration of all factors can allow us to simulate the reliable HD 200964 planetary system.

We use various models and methods developed and described in previous papers. For instance, the scenario of formation of close planetary systems formed of two giants has been developed in Correa-Otto et al. (2013). It includes an interaction between different planetary migration types (types I and II),

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planetary growth and gap formation in the protoplanetary disk. The joint action of these mechanisms has proved to be efficient to reproduce the behaviour of the HD 45364 system with two close and massive planets currently evolving in the 3/2 MMR (Correia et al. 2009). It is worth noting here that the choice of this formation model in this work was done after the detailed investigation of the planetary dynamics in the neighborhood of the 4/3 MMR. The study was done in form of dynamical maps (Michtchenko et al. 2002, Ferraz-Mello et al. 2005), which showed that the resonance capture would be possible only in the stage when the planets were still embryo-sized.

The planetary configuration of the solution obtained in the simulation of formation is then tested, in order to verify if the system could survive over the whole lifetime of the central star. This is frequently done by means of purely numerical integrations of the exact equations of motion over extended timespans (e.g., Wittenmyer et al. 2012). In this work, we apply an alternative approach which focuses on the general dynamics of systems involved in mean-motion resonances (Beaugé et al. 2003, Ferraz-Mello et al. 2006, Michtchenko et al. 2006, among others). In practice, instead of testing the stability of individual solutions, we determine the domains of stable motion near the 4/3 MMR (for details, see Michtchenko et al. 2008 a,b). These domains are located around stable stationary configurations (known as Apsidal Corotation Resonances, ACRs), which are obtained applying the Hamiltonian model of the resonant behaviour to the 4/3 MMR (Michtchenko et al. 2006). The stable ACRs constrain the planetary geometry favorable for the regular evolution in the 4/3 MMR, when the orbits are anti-aligned and, at the conjunction, the inner planet is at the pericenter of its orbit, while the outer planet is at apocenter.

The stable domains of the 4/3 MMR are delimited by numerous overlapping high-order mean-motion resonances (Wisdom 1980), whose locations and widths are very sensitive to the changes in the stellar and planetary masses. This feature allows us to put constraints on the masses and the inclination of the HD 200964 orbits to the sky plane.

The dynamical stability of the HD 200964 system is also tested considering the variation of the mass of the central star during the stellar evolution from the main sequence (MS) to the sub-giant branch. For this, we estimate the main sequence mass of the HD 200964 star using the empirical relationship between the age of the star and its mass at the MS-stage (Inglis 2003), and obtain that the mass loss was ~ 3 %. We consider the possible implications of the stellar mass loss for planetary dynamics and show that, for small values, the stability of the planetary motion is not affected. This result is in agreement with the results obtained by Voyatzis et al. (2013), which showed that the planetary motion is destabilized when the loss of the stellar mass reaches 10 %.

Finally, we re-determine the orbits of the planets from the radial velocity measurements given in Jonhson et al. (2011), where the best-fit solution was obtained using the non-updated stellar mass 1.44 $M_\odot$. Our main goal was to extend the search, looking for the possible solutions out of the 4/3 MMR. The analysis was based on the biased Monte Carlo procedure (Ferraz-Mello et al. 2005, Tadeu dos Santos et al. 2012), that uses a standard orbit improvement technique with starting values taken at random in a large set of initial conditions. The constraints on the planetary motions provided by the previous stability study were also implemented. As a result, we obtained the confidence interval of statistically good and stable solutions inside the 4/3 MMR, compatible with the solution obtained from the simulation of formation.

The paper is organized as follows. In Sect. 2, we present dynamical maps of the region between the 2/1 and 4/3 MMRs. In Sect. 3, we explore the formation scenario, including stellar mass evolution, and emphasize the conditions necessary for the formation of the HD 200964 system. In Sect. 4, we develop a dynamical study of the 4/3 MMR, employing the dynamical maps and dynamical power spectra techniques. In Sect. 5 we re-analyze the radial velocities data linking the orbital solutions obtained with the results described in Sect. 3. Finally, in Sect. 6, we summarize our results.

2. Dynamical map of the region between the 2/1 and 4/3 resonances

According to classical theories of migration, gravitational interactions between the protoplanetary disk and planets drive the planets towards the central star (Lin & Papaloizou 1979; Goldreich & Tremaine 1979, 1980). If the migration of a planetary pair is convergent (i.e., the mutual planetary distance is decreasing), the planets can be captured into a mean-motion commensurability and continue to decay evolving in the resonance (e.g., Lee & Peale 2002; Ferraz-Mello et al. 2003; Beaugé et al. 2003; Beaugé et al. 2006). This mechanism is widely accepted to explain the existence of many extra-solar systems currently evolving inside mean-motion resonances.

To obtain the possible migration routes of the system towards the 4/3 MMR, we analyze the dynamics of the planets in the region between the 2/1 and 4/3 MMRs. Using typical values of the physical and orbital parameters of exoplanets, we construct dynamical maps on the $(n_2/n_1, e_2)$ representative plane, where n_1 and n_2 are the **osculating** mean motions of the inner and outer planets, respectively, and e_2 is the **osculating** eccentricity of the outer orbit. The maps are presented in Figure 1. In the construction of the maps, each $(n_2/n_1, e_2)$–plane was covered with a rectangular grid of initial conditions, with spacings $\Delta(n_2/n_1) = 0.002$ and $\Delta e_2 = 0.002$. The semimajor axis and the eccentricity of the inner planet were fixed at $a_1 = 1$ AU and $e_1 = 0.001$, respectively.

The initial values of the mean longitudes were fixed at $\lambda_1 = \lambda_2 = 0$, while the difference of the longitudes of the pericenter of the planets, $\Delta\varpi = \varpi_2 - \varpi_1$, was fixed at either 0 (positive values on the e_2-axis in Figure 1) and 180° (negative values on the e_2-axis). **The chosen values of the angular elements correspond to the 0– or π–values of the resonant angles of the mean-motion resonances which populate the domain under study. On the one hand, these configurations, known also as symmetric stationary solutions, are mostly favorable to stable resonant motions, specially at high eccentricities (Ferraz-Mello et al. 2003, Michtchenko et al. 2006, Michtchenko et al. 2008 a). On the other hand, from the point of view of capture in resonance, the angular elements can be chosen arbitrarily. Indeed, as will be shown in Section 3, the probability of the resonance trapping is not affected by the choice of the angular elements provided that capture occurs when the planetary orbits are nearly circular.**

We used two different sets for the planetary masses: the map obtained for $m_1 = m_2 = 1.0\,M_J$ is shown on the top graph in Figure 1, while the map obtained for $m_1 = m_2 = 0.1\,M_J$ is shown on the bottom graph. The different values of the masses were used to understand qualitatively the dependence of the dynamical features on the individual masses of the planets.

Each point of the grid of initial conditions was numerically integrated over 1.3×10^5 yr and the output of integration was

HINTS FOR EFFECTIVE WRITING

something about style

disclaimer

I am not a native English speaker and I am not a creative-writing professional. Everything that follows should be taken as my best attempt to teach my students intricacies and idiosyncrasies of physics writing, based on my own experiences and on reading inspiring literature. I claim no responsibility to the damage inflicted on students by following my advice too closely and producing unintelligible and grammar offensive research articles. Beware of my grammar hints. I am especially offensive to the articles ("the", "a", "an", and the worst of all, none, "..."). I feel absolved by being a Slavic language (read: article-free) native speaker.

- In ~~the~~ Figure 1 ...
- In the next figure ... **OK**

Hint 1

Pick a published paper you like and try to emulate its structure and style

Learn from eminent physics writers

Some of my favorite physics writings are:

- S. Weinberg: Relativity and Cosmology
- Feynman, Leighton, Sands: Feynman Lectures in Physics
- Landau and Lifschitz: Course in Theoretical Physics (*)

(*)I would not recommend emulating the style of L&L in research papers, unless you can emulate their physics.

Hint 2
Understand what you write, be clear

- Distance yourself from the writing to see it unbiased
- Logic must flow
- Ask a colleague if in doubt that writing may be incomprehensible

useful point: Do not write "The energy increases with pressure", but "The energy increases with increasing pressure", to be clear, since one can often mean the opposite ("At low fields the rate decreases" can mean that the rate increases with *decreasing* fields, but one never knows.)

Hint 3
structuring into ideas
=
structuring into paragraphs

- Place clue sentences in the beginning
- Read the paragraph and rewrite it if the logic does not flow

Hint 3
structuring into ideas
=
structuring into paragraphs

- Place clue sentences in the beginning
- Read the paragraph and rewrite it if the logic does not flow

Exemplo de 1ª frase do paragrafo:
The time evolution of the volumetric mass density is shown in Figure 1.

Hint 4
Write in active voice

I show that the process occurs

These results show that ...

(NO: It is shown by these results that ...)

- Be concise, precise, and direct
- Stay focused

Hint 5
Be consistent

If there is an allowed ambiguity, stick to your choice throughout the paper:

For example: "We take five configurations

for the macrostate. Each microstate is defined by ..." Either pick microstate or configuration, some may get confused. Similarly with grammar. For example, if you describe an experiment in the past sense, do not switch randomly to the present one.

Hint 6
No offense

Avoid if possible words like

- Clearly
- Obviously
- As is well known
- Of course

Hint 7
Read the guidelines

- Early in your professional life read the guidelines for authors to the journal you write for. Adhere to the most relevant points in future writings.

Hint 8
Do not overdo

- Footnotes
- In-line equations
- References
- Figures
- Latin phrases
- Acronyms

Hint 9
referring

- Include only equations, figures, tables, and references that you refer to
- Carefully define every term in equations
- Define all the lines and symbols in figures
- Each figure and table comes with a caption
- Number all equations
- All nontrivial statements should be explained or referenced

Hint 10
Revise 5-10 times

- Spell check
- Grammar check
- Check for flow
- Shorten
- Give the paper to a colleague for opinion
- Stop revising after a revision eliminates a previous revision, or if you are revising 10th time. There is little chance you will improve anything.

Final hint

Do not put too much emphasis on writing. It is a tool to communicate your research, no less and no more.

An average paper is cited perhaps 4 times, and read perhaps 7 (4 plus 2 referees plus 1 random reader) times. You need to balance your time. I know of terribly written articles that are cited 500 and more times. In the end, it is the idea that you present, and not the form of the presentation, that will be remembered.

Single authors:
I or we?

- I prefer I when addressing work done by myself:

I show that…

- Using we is more formal and authoritative; it diffuses responsibility
- There can still be we, if inviting the reader to join the discussion:

If we substitute A for B

or

If one substitutes A for B

Hints for effective writing

à la Barbara Goss Levi (*)

http://www.aps.org/units/fed/newsletters/dec97/rules.html

1. Practice writing short summaries of longer articles

   (get the message out)

2. Combine writing with inspiring reading

   (emulate the style of your favorite writing)

3. Get rid of superfluous words

   (there is ..., the fact that ...)

4. Rewrite if it is not clear
5. Define your terms
6. Good writing is clear thinking

Muita leitura!


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produce

produzir

Definições de produce

verbo

make or manufacture from components or raw materials.
"the company has just produced a luxury version of the aircraft"
sinônimos: manufacture, make, construct, build, fabricate, put together, assemble, turn out, create, mass-produce, churn out

cause (a particular result or situation) to happen or come into existence.
"no conventional drugs had produced any significant change"
sinônimos: give rise to, bring about, cause, occasion, generate, engender, lead to, result in, effect, induce, set off, provoke, precipitate, breed, spark off, trigger, beget

substantivo

things that have been produced or grown, especially by farming.
"dairy produce"
sinônimos: food, foodstuff(s), products, harvest, crops, fruit, vegetables, greens

Traduções de produce

verbo

produzir	produce, yield, make, create, bring forth, form
fabricar	manufacture, make, produce, fabricate, labour, labor
apresentar	present, introduce, show, represent, announce, produce
manufaturar	manufacture, create, make, produce, turn out
exibir	display, exhibit, blazon, bring out, expose, produce
expor	expose, exhibit, expound, imperil, disclose, produce
mostrar	show, display, set forth, turn up, indicate, produce
levar à cena	create, produce
editar	edit, create, produce, redact, publish, put out
publicar	publish, announce, bill, get out, bring out, produce

substantivo

o produto	product, yield, outgrowth, proceeds, produce, production
a produção	production, output, produce, turn-out, generation, growth

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SUBMIT & FIGHT

Submission letter

Dear Editor,

We submit a manuscript entitled „Falling cats with jelly on the back: stable equilibrium versus instinct", by E. Schroedinger and A. Einstein, for publication in Physical Review Letters.

The manuscript considers the important problem of cats with a jelly spread on their back. The cats are left to fall free from a height of at least 50 cm, and observed in their fall. We have discovered that cats do not fall. Instead, they hover indefinitely. Our conclusions have far reaching consequences for both physics and biology. We are now pondering about what happens to the cats when they are entangled.

The importance of our work as well as far reaching consequences of our discovery justify our manuscript to be considered for publication in Physical Review Letters. Below we suggest physicists who should be qualified to referee our work.

Sincerely,
E. Shroedinger
A. Einstein

Suggested referees: N. Bohr (Copenhagen), L. Boltzmann (Graz), L. Landau (Charkov)

Referee reports

Re: Falling cats with jelly ...
By: E. Schroedinger and A. Einstein

Dear Dr. Schroedinger:

The above manuscript has been reviewed by our referee(s). On the basis of the enclosed critique, we judge that the work does not meet the special criteria of importance and broad interest required for Physical Review Letters. We also wish to emphasize that we take strong stance on the animal rights issue and we do not endorse experimenting with live animals, with our without jelly on their backs.

Yours sincerely,

E. Rutherford
Senior Editor

encl. Referee reports

Referee A

This paper presents an experimental treatment of combined effects of mechanical rotation and animal instincts. The treatment is sound, but cruel. I question the conclusions of the manuscript on the basis that the authors used only 1 cat which must have felt depressed about being thrown repeatedly from the Physics Department windows. As is known from the work of C. Darwin, depressed cats tend to hover in the air. The authors have failed to separate the effects of depression from those of mechanical rotation and biological instincts. Therefore I do not recommend the paper for publication in Physical Review Letters in the present form, although the subject itself is of great importance.

Referee B

The group of E. Schroedinger publishes reliable and interesting results (though I have some doubts about Dr. Einstein who tends to be off at times). The paper is well written, the results clearly stated. The subject is definitely of broad interest, as I have myself pondered about such things. The only question I have is whether the work is suitable for Physical Review Letters, or should be published in the „American Journal of Falling Cats"? I opt for the latter.

Resubmission letter

Dear Editor,

We resubmit our mansucript entitled „Falling cats with jelly on the back: stable equilbrium versus instinct", by E: Schroedinger and A. Einstein, for publication in Physical Review Letters.
We consider the criticism of the referees well meant, and in fact supporting publication in your journal. Referee A says „The treatment is sound..." and „...is of great importance." Referee B claims that the paper is well written and of broad interest. We address the few minor critical points in the enclosed response to the referees.
Since we have addressed ALL the referee comments, and since the comments themselves can be interpreted as positive, we strongly request that you publish our manuscript without further delay.

Sincerely,
E. Shroedinger
A. Einstein

Response to the referees

Response to referee A: We thank the referee for his or her thoughtful comments and for carefully reading our manuscript. We were not aware of the important research of C. Darwin on falling depressed cats. Taking into consideration that our cat could have indeed been depressed by both falling down so often and having jelly on the back, and so not wanting to really fall down, we have put the cat on an antidepressant (Whiskas Prozac) and let it fall several times again. We are happy to report that our original results stay unchanged. Unfortunately, the poor cat has died. Probably from an overdose of Prozac.

Response to referee B: We appreciate the referee's well thought comments and for suggesting an alternative journal for our manuscript. We have looked at several recent issues of AJFC to see if indeed this would be the appropriate place for our cat. Unfortunately, AJFC seems to publish only very technical papers on the subject, with little emphasis on the physics involved. We strongly believe that PRL is the most suitable journal for publishing our work.

Acceptance (rejection) letter

Re: Falling cats with jelly ...
By: E. Schroedinger and A. Einstein

Dear Dr. Schroedinger:

We are pleased to inform you that the above manuscript has been accepted for publication. You are requested to make a payment of $1000 toward the cost of disseminating your research results.

Yours sincerely,

E. Rutherford
Senior Editor

Some useful phrases in communicating research

"It has long been known..." = I didn't look up the original references
"A definite trend is evident..." = This data is practically meaningless
"Of great theoretical and practical importance..." = Interesting to me
"While it has not been possible to provide definite answers to these questions..." = An unsuccessful experiment, but I still hope to get it published
"Three of the samples were chosen for detailed study..." = The results of the others didn't make any sense
"Typical results are shown..." = The best results are shown
"These results will be shown in a subsequent report..." = I might get around to this if I'm pushed
"The most reliable results are those obtained by Jones..." = He was my graduate assistant
"It is believed that..." = I think
"It is generally believed that..." = A couple of other guys think so, too
"It is clear that much additional work will be required before a complete understanding of the phenomenon occurs..." = I don't understand it
"Correct within an order of magnitude..." = Wrong
"It is hoped that this study will stimulate further investigation in this field..." = This is a lousy paper, but so are all the others on this miserable topic
"A careful analysis of obtainable data..." = Three pages of notes were obliterated when I knocked over my beer
"Reasonable order of magnitude..." = Wild guess
"Non-trivial problem..." =It doesn't work, but if we throw enough money at it, something's bound to happen
"Within the current state of the art..." = Maybe we can do it
"On the leading edge of technology..." = It ought to be possible - send more money!
"Given a reasonable preventive maintenance program..." = Buy our service contract
"Our results confirm and extend previous conclusions" = We find nothing new
"I thank Joe Blotz for assistance with the experiment and Cindy Adams for valuable discussions" = Joe Blotz did the experiment and Cindy Adams explained it to me

ACADEMIC HONESTY

- Proper referencing
- Acknowledging ideas of others
- Respecting competitors
- Unbiased recommendations for positions, invited talks, seminars
- Fair grant evaluations
- Honest reporting of research methods, approximations, results
- Honest reporting on accomplishments