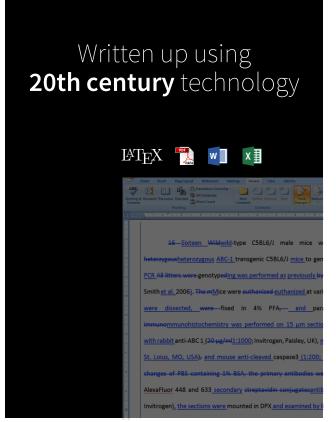
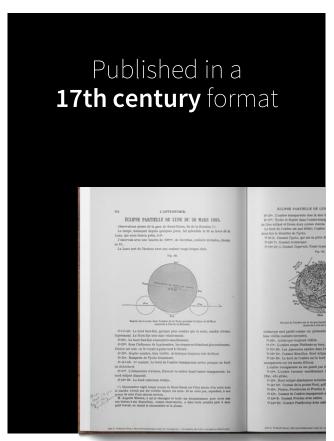


Research is becoming more computational, collaborative, datadriven, automated, and web-based.



Most paper formats are <u>not</u> natively **collaborative**, **data-driven**, **version controlled**, or backwards **compatible**.

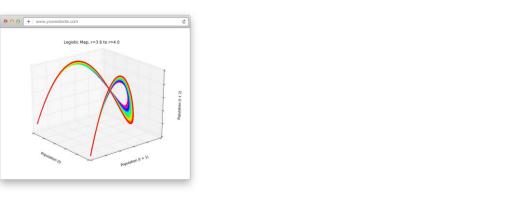


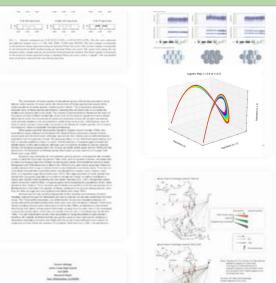
A centuries-old research "paper" is much like papers we publish, share and read today (i.e., **static**, **2D** PDFs)

THE CHALLENGE

Current publishing workflows "flatten" rich research content











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Research Funding

Vedecká Grantová Agentúra MŠVVaŠ SR a SAV. Grant Number: 2/0116/17

Agentúra na Podporu Výskumu a Vývoja. Grant Number: APVV-15-0726

Keywords

molecular orbitals

spin-orbit coupling

visualization

Publication History

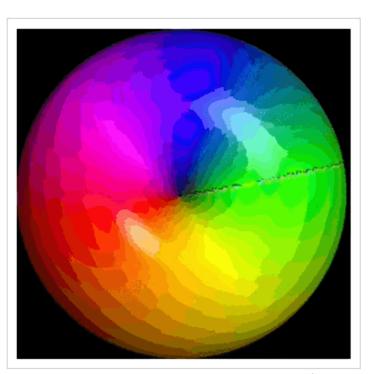
Issue Online:

24 September 2018

Version of Record online: 28 August 2018

Manuscript accepted: 11 May 2018

Now, the time-dependent (TD) version of our orbital, end, has a rotating phase factor. If multiplication by a phase factor rotates an angular momentum eigenfunction, then a continually changing phase factor will cause such a wavefunction to spin round and round (a feature of orbital angular momentum functions noted in Ref.10). This is shown in Animation 1A. Now, this necessarily causes both the real and imaginary components-which look like p-orbitals - to spin around as well. This is shown in Animation 1B, which depicts $Re[e^{-R}\psi_{+}]$ (the imaginary component, $Im[e^{-it}\psi_*]$, looks the same as $Re[e^{-it}\psi_*]$ but rotated $\pi/2$ anticlockwise, so is not plotted. t is in arbitrary units with E dropped for simplicity).



Animation 1A

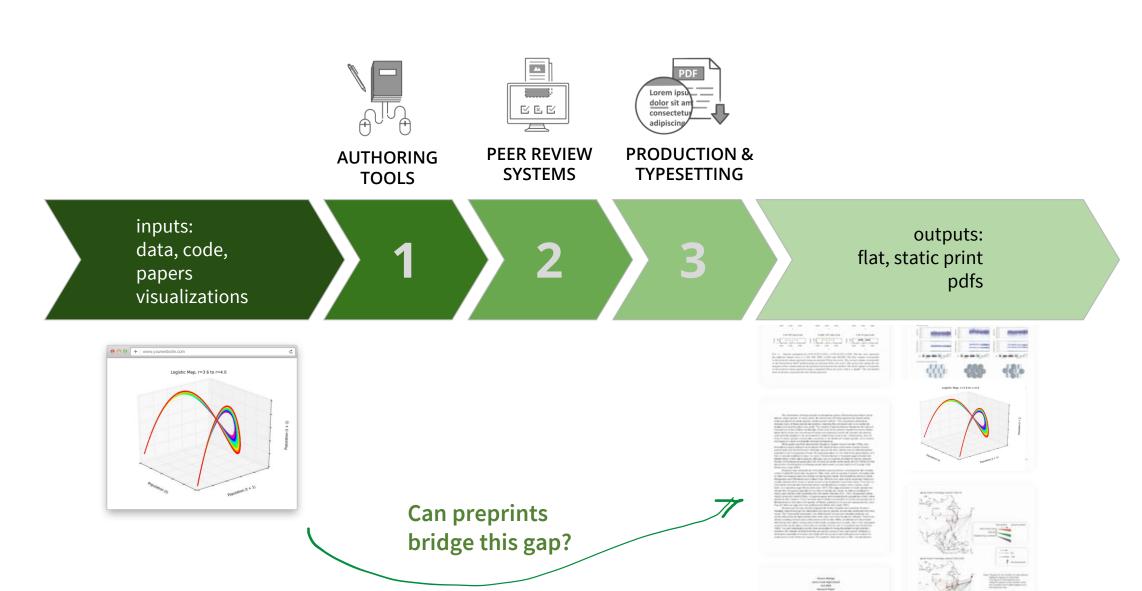
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Time-dependent p_+ -orbital ($e^{-iEt}\psi_+$), phase-colored.

THE CHALLENGE

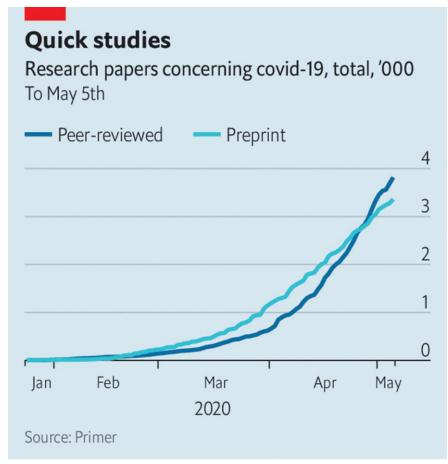
Current publishing workflows "flatten" rich research content



Preprint | 'prē-,print | noun



- 1. An early research output.
- 2. A version of a scholarly paper that precedes formal peer review and publication in a peer-reviewed journal. The preprint, often a non-typeset version available free, persists after a paper is published in a journal.



The Economist

Before 2020, preprints were few and limited to the physical sciences

In 2020, for each peer reviewed publication about COVID-19, a preprint was posted

In total, 30,000 preprints about COVID-19 appeared in 2020. A third of them were mentioned by news articles (cf w 1% baseline)





Edited By: Cezmi Akdis Impact factor: 13.146

2020 Journal Citation Reports (Clarivate Analytics): 1/28 (Allergy) 9/162 (Immunology)

Online ISSN: 1398-9995

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98 VIEWS

Management and outcome of suspected and confirmed COVID-19 (SARS-CoV-2) vaccine hypersensitivity.

ANAPHYLAXIS COVID-19 SARS-COV VACCINES

Margitta Worm, A. Alexiou, Andrea Bauer, Regina Treudler, Gerda Wurpts,
Heinrich Dickel, Timo Buhl, Sabine Müller, Andreas Jung, R. Brehler, Guido Heine,

Abstract

Systemic allergic reactions to vaccines are very rare. In this study we assessed the management and outcome suspected SARS-CoV-2 vaccine hypersensitivity. We present data of 219 individuals, who experienced symptoms suspicious for an allergic reaction after the first (n=214) or the second vaccination (n=5)...

Peer review status:

IN REVISION

13 Oct 2021 O Submitted to Allergy
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02 Nov 2021 6 Editorial Decision: Revise Minor

Cite as: Margitta Worm, A. Alexiou, Andrea Bauer, et al. Management and outcome of suspected and confirmed COVID-19 (SARS-CoV-2) vaccine hypersensitivity. *Authorea*. October 20, 2021.

DOI: 10.22541/au.163471495.59691401/v1

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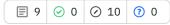












Allergenic components of the mRNA-1273 vaccine for COVID-19: possible involvement of polyethylene glycol and IgG-mediated complement activation



Ludger Klimek, Natalija Novak, Beatriz Cabanillas 📵, Marek Jutel, Jean Bousquet 📵,

Abstract

Following the emergency use authorization of the vaccine mRNA-1273 on 18th December 2020 in the US and the vaccine BNT162b2 one week earlier, two mRNA vaccines are in currently used for the prevention of coronavirus disease 2019 (COVID-19). Phase 3 pivotal trials on both vaccines excluded individuals with a history of allergy to vaccine components...

Peer review status:

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30 Dec 2020 O Submitted to Allergy

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Nov 2021

Cite as: Ludger Klimek, Natalija Novak, Beatriz Cabanillas, et al. Allergenic components of the mRNA-1273 vaccine for COVID-19: possible involvement of polyethylene glycol and IgG-mediated complement activation. *Authorea*. January 01, 2021.

DOI: 10.22541/au.160952242.21038379/v1





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DOI: 10.22541/au.15868

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2

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Coseph Arul, Hélène

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In 2020: **11K** preprints were posted via Under Review (**1.5k** about COVID-19)

Health Sciences

Allergy

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British Journal of Clinical Pharmacology

British Journal of Pharmacology

Clinical Case Reports

Clinical Otolaryngology

Computational and Systems Oncology

Echocardiography

Influenza and other respiratory viruses

International Journal of Clinical Practice

Journal of Cardiac Surgery

Journal of Cardiovascular Electrophysiology

Journal of Evaluation in Clinical Practice

Pediatric Allergy and Immunology

Pediatric Blood & Cancer

Pediatric Pulmonology

Transboundary and Emerging Diseases

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International Journal of Quantum Chemistry

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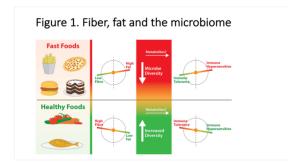
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UNDER REVIEW (35)

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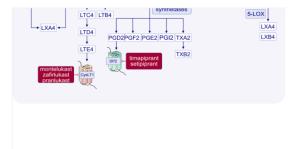


Role of Dietary Fiber in Promoting Immune Health -- An EAACI Position Paper

CV

Carina Venter and 21 more November 28, 2021

Microbial metabolism of specific dietary

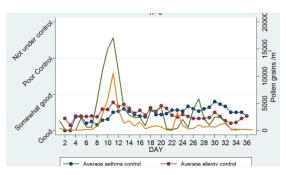


Effects of non-steroidal antiinflammatory drugs and other eicosanoid pathway modifie...



Milena Sokolowska and 16 more November 26, 2021

Non-steroidal anti-inflammatory drugs (NSAIDs)



Exposure to birch pollen and the risk of allergic and asthmatic manifestations



Timo Hugg and 4 more November 24, 2021

This is a Letter and does not include an abstract.







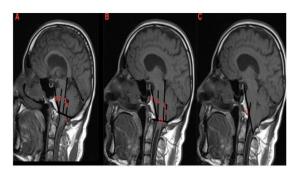
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Multi-parameter-based Radiological Diagnosis of Chiari Malformation using Machine Lea...



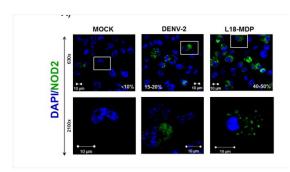
Background: The known primary radiological diagnosis of Chiari Malformation-I (CM-I) is



Water-saving techniques for restoring desertified lands: some lessons from the field



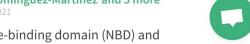
In the light of the current climate crisis, one of the most serious ecological threats is the



Dengue virus type 2 replication is limited by activation of NOD2 and its interactions...



Diana Domínguez-Martínez and 5 more April 19, 2021







Scott P. Egan @scottpegan Jul 14 New preprint!: Tissue-specific gene expression shows #cynipid #wasps repurpose host gene networks to create complex & novel parasitespecific organs on #oaks. Led by Dr. Ellen Martinson (@wasp_venom); in collaboration w/ Dr. Jack Warren & me. More to come.

doi.org/10.22541/au.15...





Emma Moffett @EmmaMoffett1 Oct 10 Multigenerational exposure to warm temperatures reduces metabolic rate but increases boldness! Check out our new preprint at @authorea #paceoflife #thermaladaptation @KevinSimoNZ @davefryx doi.org/10.22541/au.16...

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Micah Brush @MicahBrush New preprint is up! authorea.com/users/344416/a...

This analysis was mostly done by an undergraduate in our group, Juliette Franzman, with data collected at RMBL over many years by @benjaminblonder and his graduate student Courtenay Ray.

Q1 1 2 0 5 ····







David M Watson @D0CT0R... Nov 25 My first preprint, led by Robert Nespolo and Francisco Fonturbel. The ecology and evolution of the Monito del monte, a relict species from the southern South America temperate forests. Let us know what you think...

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Timothy P. Cripe @KidsOnc... May 7 @nationwidekids leads discussion with a new record - 7 days from concept to acceptance and posting on public server! Pediatric Cancer Research: Surviving COVID-19 authorea.com/users/319136/a...

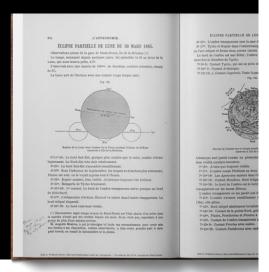


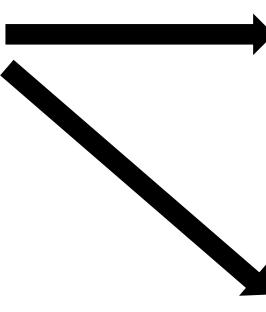




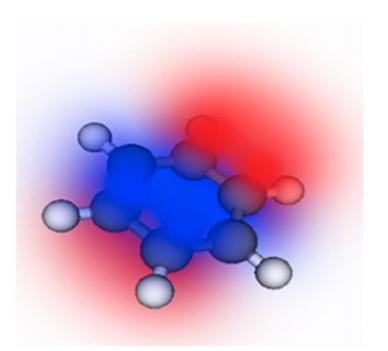
Heidi Schutz @heidihabilis 6d So pleased to share a preprint of our recently submitted paper. Cheers to an amazing group of coauthors @PhysIsPhun @pumtiwitt @WrightingApril @kateboersma @stephIshep Lathiena Manning @MalischPhd & Roni Ellington authorea.com/users/343274/a...

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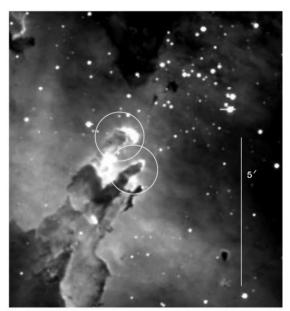
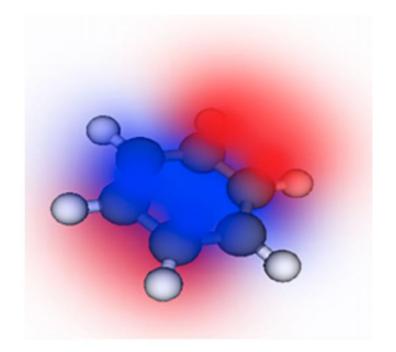
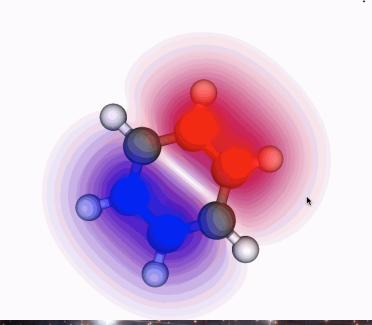


Figure 1. An Hα (+ continuum) image of M16, obtained with the CTIO/Michigan Curtis Schmidt. The stars responsible for exciting the nebula are ~2 pc from the elephant trunks, in the top right quadrant of the image. Approximate locations of the fields imaged with UNSWIRF (1.6 arcmin in diameter) are indicated. North is up and east is to the left.



Data in articles lack depth...



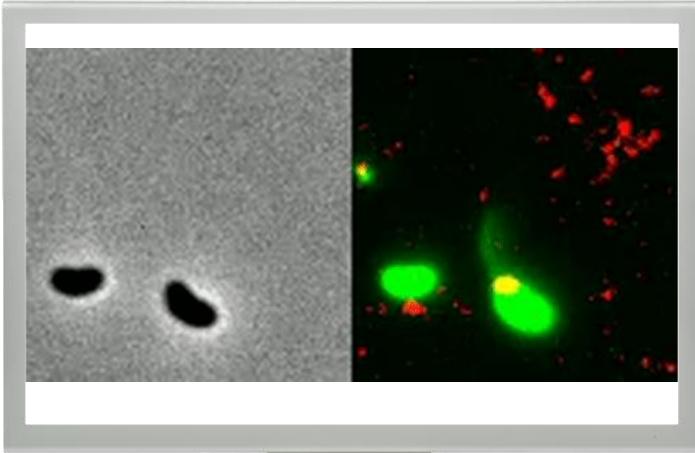
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Figure 1. An $H\alpha$ (+ continuum) image of M16, obtained with the CTIO/Michigan Curtis Schmidt. The stars responsible for exciting the nebula are ~2 pc from the elephant trunks, in the top right quadrant of the image. Approximate locations of the fields imaged with UNSWIRF (1.6 arcmin in diameter) are indicated. North is up and east is to the left.

...and they lack breadth...



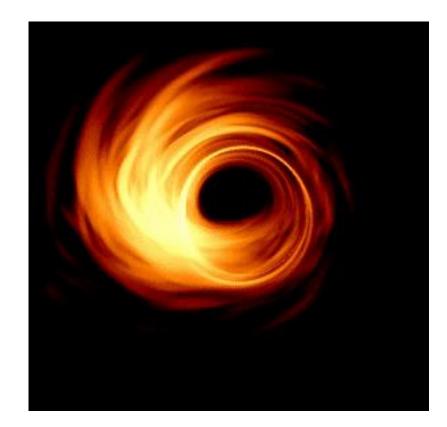
AAS World Wide Telescope

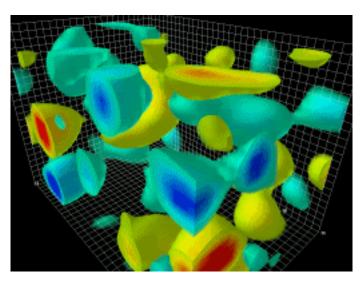






Researchers analyze data interactively in the lab, it takes work for them to make them static and dumb for a article publication





Supplementary Information are where data go to die



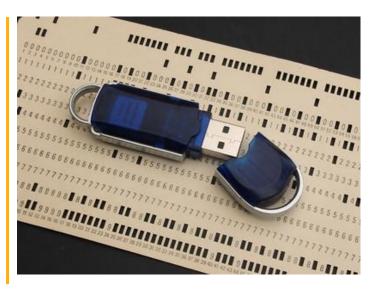
Furthermore, as we already highlighted above, the main text is often not well integrated with the supporting information provided in supplementary material. Readers often have to sift through tens or hundreds of pages of text to find information simply referenced from the main text as 'see Supplementary material'.

Use and mis-use of supplementary material in science publications

Mihai Pop 2 & Steven L. Salzberg

BMC Bioinformatics 16, Article number: 237 (2015) | Cite this article 11k Accesses | 17 Citations | 107 Altmetric | Metrics

Where is the code? Does it even work in my computer?



...while data and code may be available in repositories external to the corresponding article, it takes readers and reviewers considerable effort to verify the software and re-run analyses with, say, changed parameters. 10.22541/au.160211021.13787691/v1







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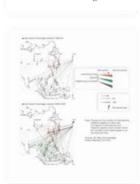
21st century publications

inputs: data, code, notebooks, visualizations

- Authors can upload rich media
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Author has options to edit preprint and publish new versions **AUTHOREA**

EDIT









Open Chemistry, JupyterLab, REST, and **Quantum Chemistry**

😰 🕰 🕫 Marcus D. Hanwell 🕞 , Chris Harris 🕞 , Alessandro Genova 🕒 , Mojtaba H Muammar El Khatib (D), Patrick Avery (D), Johannes Hachmann (D), Wibe

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Abstract

Quantum chemistry must evolve if it wants to fully leverage the benefits of the internet age, where the world wide web offers a vast tapestry of tools that enable users to communicate and interact with complex data at the speed and convenience of a button press. The Open Chemistry project has developed an open source framework that offers an end-to-end solution for producing, sharing, and visualizing quantum chemical data interactively on the web using an array of modern tools and approaches. These tools build on some of the best open source community projects such as Jupyter for interactive online notebooks, coupled with 3D ...

Peer review status:

PUBLISHED

08 Apr 2020 O Submitted to IJQC Special Issue 🗹

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17 Sep 2020 6 Published in International Journal of Quantum Chemistry. 10.1002/qua.26472 2

Cite as: Marcus D. Hanwell, Chris Harris, Alessandro Genova, et al. Open Chemistry, JupyterLab, REST, and Quantum Chemistry. Authorea. August 26, 2020.

DOI: 10.22541/au.158687268.81852407/v2

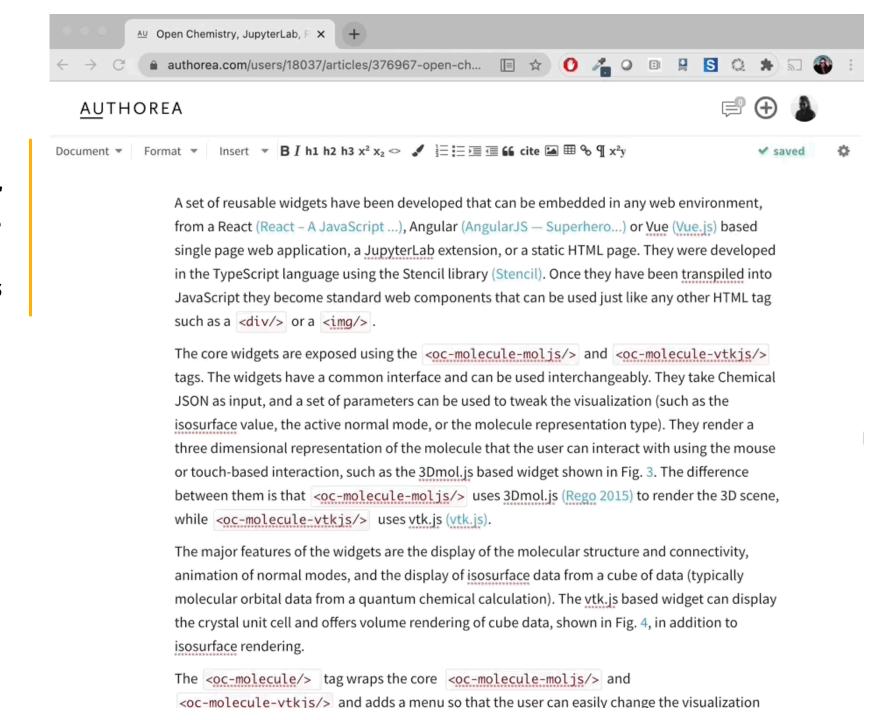


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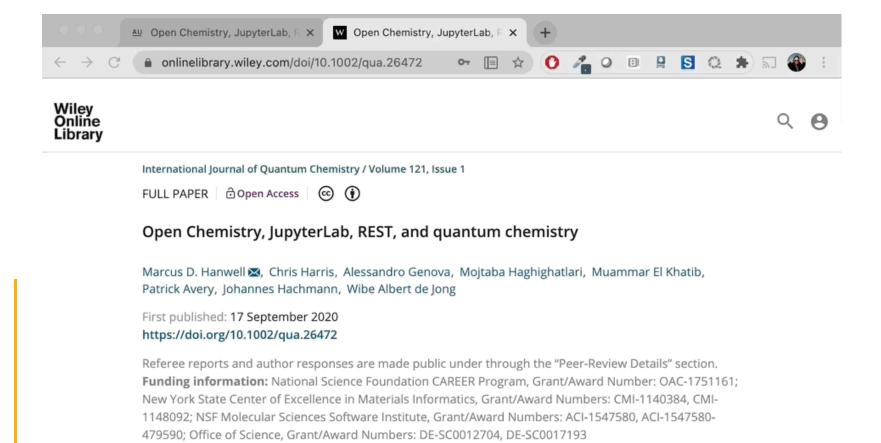


Version of Record available at: 10.1002/gua.26472

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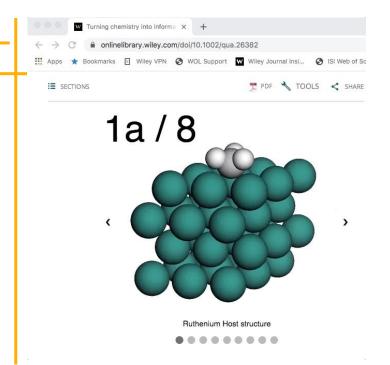


The HTML version of this article is enhanced with interactive figures, integrated source data, and links to executable code.

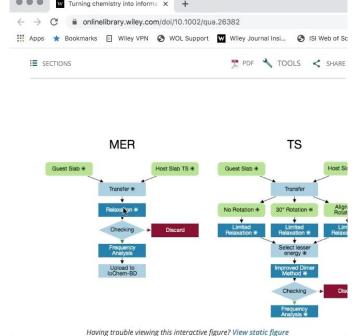
Abstract

Quantum chemistry must evolve if it wants to fully leverage the benefits of the internet age, where the worldwide web offers a vast tapestry of tools that enable users to communicate and interact with complex data at the speed and convenience of a button press. The Open

- Data in articles lack - depth and breadth All rich media objects (data, code, notebooks, and interactive visualizations) are pushed and published in the version of records



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Data are connected to the figure that describe them.
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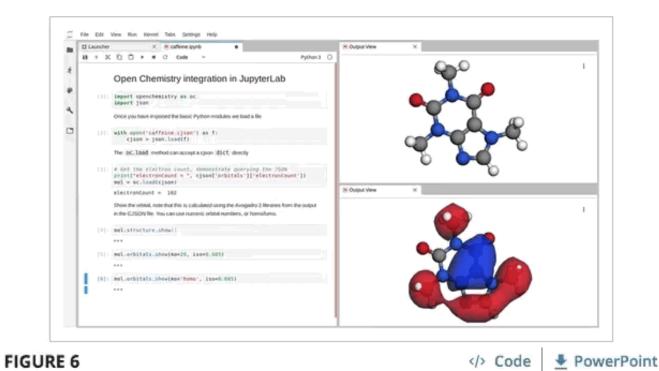
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Where is the code? Does it even work in my computer?

The code is in the figure, in an executable time capsule



extended to support execution without a data server and packaged using pip so that it c be installed via the mechanism offered by the Binder project. A blog post was written in December, 2018, describing the approach^[58] and showing the Binder repository with example links to data for calculations^[59] (Figure 6).



The JupyterLab extension allows the visualization of molecular structures in a notebook, with Binder used here to offer a static repository to offer a more interactive exploration of data

PUBLISH









Open Chemistry, JupyterLab, REST, and Quantum Chemistry

Marcus D. Hanwell , Chris Harris , Alessandro Genova, Mojtaba Haghighatlari, Muammar El Khatib, Patrick Avery, Johannes Hachmann, Wibe Albert de Jong

Peer Review Material

Review for: "Open Chemistry, JupyterLab, REST, and Quantum Chemistry"

Anonymous IJQC Reviewer

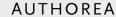
April 11, 2020

Review for: "Open Chemistry, JupyterLab, REST, and Quantum Chemistry" Roberto Di Remigio

May 20, 2020

peer review reports (signed and anonymous)

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Review for: "Open Chemistry, JupyterLab, REST, and Quantum Chemistry" 2



R Roberto Di Remigio 🕩

Abstract

The manuscript describes the features of a platform developed by the OpenChemistry consortium that bridges many prominent technologies in data sharing, analysis, and visualization. The platform unifies a web-based GUI with few computational backends and can be used to visualize and analyze pre-existing data or newly produced computational results.

The development of this platform is timely and the description in the manuscript is clear and compelling. I recommend the paper be published with minor revisions, suggested in the following.

I hereby give permission to publicly associate my name to this referee report.

Editor's Note: Accepted version of this

manuscript https://doi.org/10.22541/au.158687268.81852407/v2

Cite as: Roberto Di Remigio. Review for: "Open Chemistry, JupyterLab, REST, and Quantum Chemistry". Authorea. September 02, 2020.

DOI: 10.22541/au.159906594.42729025



1 Referee Report

I would first like to thank the authors for describing their work in a language approachable also to those that are not steeped into novel web-based technologies. The submission is timely and is extremely well-suited for publication in an interactive format. Finally, I couldn't agree more with



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