



CRedit — the Contributor Roles Taxonomy

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#NISOPlus20

http://bit.ly/NISOPlus_CRedit

CReditT: Origins and Approaches

Gabriel Harp
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NISO Plus Conference: February 24, 2020



The MIT Press

1 Rogers Street, Cambridge, MA 02142

The Origins of CRediT

What Is CRediT?



The Contributor Roles Taxonomy is a high-level taxonomy of 14 roles used to represent the contributions typically made to scientific scholarly output.

<https://casrai.org/credit/>



The Need for CRediT



- Research is increasingly collaborative
- Number of authors per paper is rising
- Norms differ by field about the placement and significance of the order of authors
- We fail to capture the true contributions in a transparent and structured manner





The ATLAS Experiment at the CERN Large Hadron Collider

OPEN ACCESS | THE CERN LARGE HADRON COLLIDER: ACCELERATOR AND EXPERIMENTS

The ATLAS Collaboration, G Aad⁸¹, E Abat¹⁸, J Abdallah¹⁶², A A Abdelalim⁴⁶, A Abdesselam¹¹⁶, O Abidinov¹⁰, B A Abi¹¹¹, M Abolins⁸⁶, H Abramowicz¹⁵⁰, E Acerbi⁸⁷, B S Acharya¹⁵⁹, R Achenbach⁵⁵, M Ackers²⁰, D L Adams²³, F Adamyan¹⁶⁹, T N Addy⁵³, M Aderholz⁹⁸, C Adorisio³⁵, P Adragna⁷², M Aharrouche⁷⁸, S P Ahlen²¹, F Ahles⁴⁵, A Ahmad¹⁴⁶, H Ahmed², G Aielli¹³³, P F Åkesson²⁸, T P A Åkesson⁷⁶, A V Akimov⁹³, S M Alam¹, J Albert¹⁶⁴, S Albrand⁵², M Aleksa²⁸, I N Aleksandrov⁶², M Aleppo⁸⁷, F Alessandria⁸⁷, C Alexa²⁴, G Alexander¹⁵⁰, T Alexopoulos⁹, G Alimonti⁸⁷, M Aliyev¹⁰, P P Allport⁷⁰, S E Allwood-Spiers⁵⁰, A Aloisio¹⁰¹, J Alonso¹⁴, R Alves¹²², M G Alvigi¹⁰¹, K Amako⁶³, P Amaral²⁸, S P Amaral²⁸, G Ambrosini¹⁶, G Ambrosio⁸⁷, C Amelung²⁸, V V Ammosov¹²⁶, A Amorim¹²², N Amram¹⁵⁰, C Anastopoulos¹⁵¹, B Anderson⁷⁴, K J Anderson²⁹, E C Anderssen¹⁴, A Andreazza⁸⁷, V Andrei⁵⁵, L Andricek⁹⁸, M-L Andrieux⁵², X S Anduaga⁶⁷, F Anghinolfi²⁸, A Antonaki⁸, M Antonelli⁴⁴, S Antonelli¹⁹, R Apsimon¹²⁷, G Arabidze⁸, I Aracena¹⁴², Y Arai⁶³, A T H Arce¹⁴, J P Archambault²⁷, J-F Arguin¹⁴, E Arik¹⁸, M Arik¹⁸, K E Arms¹⁰⁸, S R Armstrong²³, M Arnaud¹³⁵, C Arnault¹¹³, A Artamonov⁹⁴, S Asai¹⁵², S Ask⁷⁹, B Asman¹⁴⁴, D Asner²⁷, L Asquith⁷⁴, K Assamagan²³, A Astbury¹⁶⁴, B Athar¹, T Atkinson⁸⁴, B Aubert⁴, B Auerbach¹⁶⁸, E Auge¹¹³, K Augsten¹²⁵, V M Aulchenko¹⁰⁶, N Austin⁷⁰, G Avolio²⁸, R Avramidou⁹, A Axen¹⁶³, C Ay⁵¹, G Azuelos⁹¹, G Baccaglioni⁸⁷, C Bacci¹³⁴, H Bachacou¹³⁵, K Bachas¹⁵¹, G Bachy²⁸, E Badescu²⁴, P Bagnaia¹³², D C Bailey¹⁵⁴, J T Baines¹²⁷, O K Baker¹⁶⁸, F Ballester¹⁶², F Baltasar Dos Santos Pedrosa²⁸, E Banas³⁷, D Banfi⁸⁷, A Bangert⁹⁸, V Bansal¹²¹, S P Baranov⁹³, S Baranov⁵, A Barashkou⁶², E L Barberio⁸⁴, D Barberis⁴⁷, G Barbier⁴⁶, P Barclay¹²⁷, D Y Bardin⁶², P Bargassa¹¹⁶, T Barillari⁹⁸, M Barisonzi³⁹, B M Barnett¹²⁷, R M Barnett¹⁴, S Baron²⁸, A Baroncelli¹³⁴, M Barone⁴⁴, A J Barr¹¹⁶, F Barreiro⁷⁷, J Barreiro Guimarães da Costa⁵⁴, P Barrillon¹¹³, A Barriuso Poy²⁸, N Barros¹²², V Bartheld⁹⁸, H Bartko⁹⁸, R Bartoldus¹⁴², S Basiladze⁹⁶, J Bastos¹²², L E Batchelor¹²⁷, R L Bates⁵⁰, J R Batley²⁶, S Batraneanu²⁸, M Battistin²⁸, G Battistoni⁸⁷, V Batusov⁶², F Bauer¹³⁵, B Bauss⁷⁸, D E Baynham¹²⁷, M Bazalova¹²³, A Bazan⁴, P H

Related Articles

1. The integration and engineering of the ATLAS SemiConductor Tracker Barrel
2. Combined performance tests before installation of the ATLAS Semiconductor and Transition Radiation Tracking Detectors
3. Combined performance studies for electrons at the 2004 ATLAS combined test-beam

[More](#)

Related Review Articles

1. Liquid noble gas detectors for low energy particle physics
2. Comparative analysis of SN1987A antineutrino fluence
3. Particle identification using time of flight

CRediT Roles



Conceptualization

Data Curation

Formal Analysis

Funding Acquisition

Investigation

Methodology

Project Administration

Resources

Software

Supervision

Validation

Visualization

Writing – Original Draft

Writing – Review &

Editing



A Few Notes on Roles



- An author can have more than one CRedit role
- Multiple authors can each have the same CRedit role
- CRedit allows for the designation of *lead*, *supporting*, and *equal* degrees of contribution



Development Timeline



2012

2013

2014

2015

2020

Workshop
co-hosted by
the Wellcome
Trust and
Harvard
University

Testing of
the draft
taxonomy
with recent
authors

Publication
of *Nature*
commentary
outlining the
proposed
taxonomy

First
adoption by
Cell Press,
PLOS, and
others

Adoption by
120+ journals



Three Publishing Approaches to CRediT

Mandatory  *Recommended*  *Variable*

Mandatory Approach



- Contribution details required for all authors
- CRediT is the required format
- Example: PLOS, eLife

Author Contributions

The contributions of all authors must be described. PLOS has adopted the CRediT Taxonomy to describe each author's individual contributions to the work. The submitting author is responsible for providing the contributions of all authors at submission. We expect that all authors will have reviewed, discussed, and agreed to their individual contributions ahead of this time. Contributions will be published with the final article, and they should accurately reflect contributions to the work.

Contributor Role	Role Definition
Conceptualization	Ideas; formulation or evolution of overarching research goals and aims.



Recommended Approach



- Contribution details required for all authors
- CRedit itself is encouraged but optional; authors choose the format for contributions
- Example: Cell Press / Elsevier



Variable Approach



- Contributions statements are optional and vary depending on journal editorial offices
- The use of CRediT itself is encouraged in cases where authors list their contributions
- Example: The MIT Press



A Few Technical Notes

on the capture of metadata

Full Metadata Capture



- Submission system enables author(s) to select CRediT roles
- CRediT roles passed to Production and assigned to authors in the article XML (supported by JATS 1.2 and Elsevier's DTD)
- CRediT roles are presented in the published paper and included in the underlying metadata

```
<ce:author id="au1" author-id="s1535610817304592-□□□"  
><ce:given-name>Leire</ce:given-name><ce:surname>Bejarano  
</ce:surname><ce:contributor-role role=  
"http://dictionary.casrai.org/Contributor_Roles/Investigati  
on">Investigation  
</ce:contributor-role><ce:contributor-role role=  
"http://dictionary.casrai.org/Contributor_Roles/Writing_%E2  
%80%93_original_draft">Writing – Original Draft  
</ce:contributor-role><ce:contributor-role role=  
"http://dictionary.casrai.org/Contributor_Roles/Writing_%E2  
%80%93_review_%26_editing">Writing – Review & Editing  
</ce:contributor-role><ce:cross-ref refid="aff1" id=  
"crosref0010"><ce:sup>1</ce:sup></ce:cross-ref></ce:author>
```



No Metadata Capture



- Authors provide CRedit roles within their submitted manuscripts (Word, LaTeX, etc.)
- No capture in submission system or in article XML
- CRedit roles are published in Contributions statements but differ greatly in structure and machine-readability

cant differences in responsiveness for three conditions. A multiple comparison test was also performed using the Tukey-Kramer method (** $p < 0.005$ and *** $p < 0.001$).

SUPPORTING INFORMATION

Supporting Information for this article is available at https://doi.org/10.1162/netn_a_00113.

ROLE INFORMATION

Minkyung Kim: Conceptualization; Formal Analysis; Investigation; Methodology; Visualization; Writing - Original Draft; Writing - Review & Editing. Uncheol Lee: Conceptualization; Funding Acquisition; Project Administration; Supervision; Writing - Original Draft; Writing - Review & Editing.

FUNDING INFORMATION

Uncheol Lee, Foundation for the National Institutes of Health (<http://dx.doi.org/10.13039/>



Thank You!

ORCID and living standards (including CRedit!)



Connecting Research
and Researchers

Gabriela Mejias

Engagement Manager, EMEA

<https://orcid.org/0000-0002-1598-7181>



@gabioshka
@ORCID_Org

ORCID and standards

- ORCID is an open, not-for-profit organization run by and for the research community. Standards are an essential part of that!
- Contributorship badges prototype project



Contributor roles

Works

- author
- assignee
- editor
- chair-or-translator
- co-investigator
- co-inventor
- graduate-student
- other-inventor
- principal-investigator
- postdoctoral-researcher
- support-staff

Funding

- lead
 - co-lead
 - supported-by
 - other-contribution
- Only possible to add via Member API!
 - Usage stats?



Problems with contributors and roles

Why are they not in the UI? (They were but we removed them)

1. It was confusing for end users
2. Adding other people to works on your own ORCID record has implications we've still not worked out (but we're working on it!)

BONUS: Publishers could ask other contributors for roles, collect their iDs and update their ORCID records.



Work types and the need for living standards

- We adopted CASRAI work-types at the same time as contributor roles
- Over the years we've had to expand the list of work-types to accommodate our user and member needs (annotation, physical-object, software)
- **How do we know the community as a whole needs it? Where do we draw the line?**
- How we do this is tricky. **Wouldn't it be great if some central body could help the community do this together?**

Living standards

Requirements:

1. **Evolve** over time. There's a **community** of practice organized & processes to update it
2. **Persist!** (CASRAI work types just disappeared from the website! 🤔)

It's really hard to get the balance right. CRediT has 14 roles. It could have 140. What is the right size?



The future

- We're adding **contributors** back into the UI!
- We're adding **CRediT** to the list of currently supported roles and phasing out existing roles
(**Challenge:** we can't remove/map previous roles easily, but we will map CRediT to our existing list for older API versions)
- We really, REALLY want CRediT to be a **living standard** so we don't hit the same problems as we've had with CASRAI work types!



Thank you!



CRediT: today and tomorrow

Alison McGonagle-O'Connell | 0000-0002-9032-3983

Today

- CASRAI, NISO and Program Committee working collaboratively to standardize
 - Process completion coming expected by July 2020
- Support and track current publisher and institutional adoptions
- Funding solicitation from research funders to better resource
- Support and track tech integrations

CRedit is in adoption by dozens of organizations, across hundreds of publications

BMJ Journals

 **PLOS**

 **ELSEVIER**

**ACTA
SCIENTIAE**

 **eLIFE**

F1000



University
of Glasgow

CellPress

WormBase

Integrations

Manuscript submission & peer review systems

- Editorial Manager
- Scholar One
- eJournal Press
- ReView
- PubSweet

Other platform tools

- Rescognito
- Open Conf
 - Others!

Integration point: microPublications Workflow

microPublication

DashboardArticle

McG O'ConnellLogout

Submit your article

Enter author names in the order they will appear in the article: corresponding, first, second, etc.

Name * Must choose credit to assign to the author

Alison

Affiliations The author's affiliations

Email address *
Please type in your email

Co-Authors
Please type a co-author's name

Affiliations The author's affiliations

[ADD ANOTHER](#)

Laboratory *
Enter your PI's registered WormBase Laboratory

Funding *
Please state the sources of your funding

Title *
Bold *Ital* ^{1st} _{2nd}
Please enter the title of your manuscript

Image *
[Drop an image here to replace current](#)

Author contribution (choose all that apply)

- Conceptualization
- Data curation
- Formal analysis
- Funding acquisition
- Investigation
- Methodology
- Project administration
- Supervision

[REMOVE](#)

Integration point: microPublications Workflow

microPublication [Dashboard](#) [Article](#)

Submit your article

Enter author names in the order they will appear in the article: corresponding, first, second, etc.

Name *
Alison McGonagle-O'Connell Formal analysis x Data curation x Funding acquisition x

Affiliations Emerson College

Email address *
alison@alisonmcg.com

Co-Author Credit is required for all authors
Simon Porter Author contribution (choose all that apply) REMOVE

Affiliations The author's affiliations

[ADD ANOTHER](#)

Laboratory *
Enter your PI's registered WormBase Laboratory

Funding *
Please state the sources of your funding

Title *
Please enter the title of your manuscript

Image *
[Drop an image here to replace content](#)

Author contribution (choose all that apply):

- Conceptualization
- Data curation
- Formal analysis
- Funding acquisition
- Investigation
- Methodology
- Project administration
- Resources

Name *
Alison McGonagle-O'Connell Formal analysis x Data curation x Funding acquisition x

Affiliations Emerson College

Email address *
alison@alisonmcg.com

Co-Author
Simon Porter Data curation x Investigation x Software x

Affiliations University of Auckland

Laboratory *
12456

Funding *
Digital Science Catalyst Grant

Title *
Please enter the title of your manuscript

Integration point: Rescognito Checklist

The image shows a bioRxiv preprint article titled "Human AKTIP interacts with ESCRT proteins and functions at the midbody in cytokinesis" with DOI <https://doi.org/10.1101/2020.01.19.911891>. A purple arrow points from this DOI to the Rescognito website URL rescognito.com/ccc/10.1101/2020.01.19.911891 in the browser address bar.

bioRxiv
THE PREPRINT SERVER FOR BIOLOGY

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bioRxiv is receiving many new papers on coronavirus 2019-nCoV. A reminder: these are preliminary reports that have not been certified by peer review and should not be regarded as conclusive, guide clinical practice/health-related behavior, or be reported in news media as established information.

New Results

Human AKTIP interacts with ESCRT proteins and functions at the midbody in cytokinesis

Chiara Merigliano, Romina Burla, Mattia La Torre, Simona Del Giudice, Hsiang Ling Teo, Chong Wai Liew, Wah Ing Goh, Alexandre Chmielowski, Yolanda Olmos, Irene Chiolo, Jeremy G. Carlton, Domenico Raimondo, Fiammetta Verni, Colin Stewart, Daniela Rhodes, Graham D. Wright, Brian Burke, Isabella Saggio

doi: <https://doi.org/10.1101/2020.01.19.911891>

This article is a preprint and has not been certified by peer review [what does this mean?]

Abstract Full Text Info/History Metrics Preview PDF

Subject Area: Cell Biology

rescognito

Contribution Checklist

Human AKTIP interacts with ESCRT proteins and functions at the midbody in cytokinesis
10.1101/2020.01.19.911891

Data Availability Checklist

Contributors	Reasons (5 COGs per selection)	Reason Selections
Irene Chiolo 0000-0002-3080-550X	3 items selected	Data curation, Data visualization, Formal analysis
Jeremy G. Carlton 0000-0002-7255-1894	3 items selected	Investigation, Methodology development, Writing - original draft
Colin Stewart 0000-0002-4988-535X		Nothing selected
Graham D. Wright 0000-0003-2362-1312		Nothing selected
Isabella Saggio 0000-0002-9497-7415		Investigation, Methodology development, Writing - original draft, Writing - review and editing

Instructions: Select reasons for your contribution

Total COGs Selected: 40

Recognize


* Assuming ORCID IDs in Crossref metadata

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promoting good research citizenship. With your acknowledgment by colleagues for meaningful contributions to scholarly research.

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DOI-based URL to view awarded CRedit

 <https://rescognito.com/v/10.1111/1365-2656.13053>




rescognito Sign In

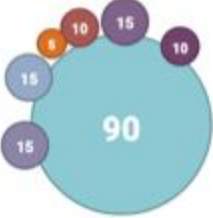
About Terms FAQ Contact English ▾ 









Warming can destabilize predator-prey interactions by shifting the functional response from Type III to Type II
[10.1111/1365-2656.13053](https://rescognito.com/v/10.1111/1365-2656.13053)

Contributors
 All

Confirmed from Crossref

-  Uriah Daugaard
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-  Owen L. Petchey
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-  Frank Pennekamp
[0000-0003-0679-1045](https://orcid.org/0000-0003-0679-1045)


90

-  Data Availability Checklist
-  Conceptualization
-  Methodology development
-  Writing - review and editing
-  Investigation
-  Writing - original draft
-  Formal analysis
-  Funder information Checklist

Summary

Amount: 30 COGs
For: Data Availability Checklist
From: Owen Petchey *
[0000-0002-7724-1633](https://orcid.org/0000-0002-7724-1633)
To: Uriah Daugaard
[0000-0003-4092-717X](https://orcid.org/0000-0003-4092-717X)

Amount: 30 COGs
For: Data Availability Checklist
From: Owen Petchey *
[0000-0002-7724-1633](https://orcid.org/0000-0002-7724-1633)
To: Owen Petchey
[0000-0002-7724-1633](https://orcid.org/0000-0002-7724-1633)

Amount: 30 COGs
For: Data Availability Checklist
From: Owen Petchey *
[0000-0002-7724-1633](https://orcid.org/0000-0002-7724-1633)
To: Frank Pennekamp
[0000-0003-0679-1045](https://orcid.org/0000-0003-0679-1045)

Amount: 5 COGs

* Contributor

Tomorrow

- Finalize standardization of the 14 role taxonomy 'as is'
- Standing committee 'kick off'
- Manage *community-driven* expansion of CRediT roles
- Analysis of contribution-related data
 - Geographic trends
 - Gender trends
 - Discipline/ subject area trends

Join us!

All are welcome to:

- Adopt
- Integrate
- Participate
- Feed back.



Thank you!



Breakout groups

1. **Governance:** How can we keep this an open, community-led standard? (Alison)
2. **Research:** What research do we need in order to shape the future direction of CRediT? (Gabe)
3. **Infrastructure:** What technical infrastructure is needed to support further adoption and use of CRediT? (Gabi)

Discuss your question and report back on up to three specific ideas from your group.

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http://bit.ly/NISOPlus_CRediT