

The background features a dark blue gradient with a starry field. Overlaid on this are several white circular elements: a large scale on the left with markings from 140 to 260, and several smaller circles with dashed lines and arrows, suggesting orbital paths or data cycles.

*DATA SHARING, CREDIT WHERE CREDIT IS DUE.*

*THE ASTROPHYSICS EXPERIENCE*

R. SMAREGLIA - INAF

# DATA SHARING: ... PERCHE' ??

- La condivisione dei dati in ambito scientifico massimizza l'utilità e l'impatto della ricerca e, pertanto, contribuisce a migliorarne la qualità e la velocità.
- Inoltre, i set di dati possono essere utilizzati per esplorare ipotesi secondarie, per meta-analisi all'interno di revisioni sistematiche o per scopi educativi.
- Nonostante questi vantaggi, in diversi campi si sottolinea che un'ampia condivisione dei dati è ostacolata dalla mancanza di incentivi per coloro che condividono i dati.
- In questo contesto, gli incentivi per i ricercatori sono spesso intesi come interventi che possono stimolare i ricercatori a impegnarsi in un comportamento particolare, in questo caso, pratiche di scienza aperta.

# I DATI IN ASTROFISICA:

## L'astrofisica e' una scienza osservativa

- Dati presenti nelle pubblicazioni ( tabelle )
- Cataloghi Astronomici
- Archivi raw e calibrati ( es.: metadata delle immagini + immagini)



## Astronomical Databases and Archives

③ [List of astronomical catalogues](#)

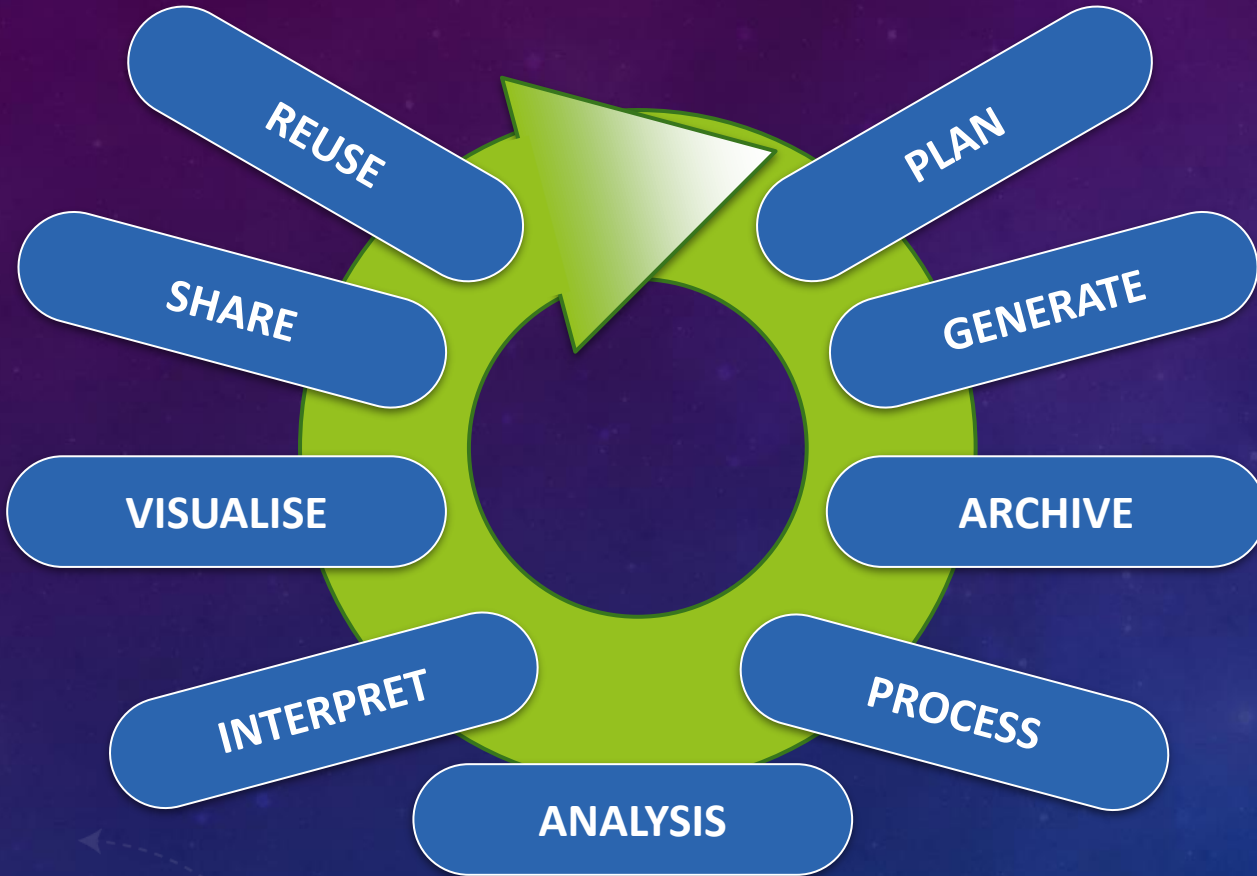
### General Data Bases

- ③ [ASDC](#) : ASI Science Data Center
- ③ [Astrophysics Data System \(ADS\)](#), USA
  - ③ [mirror at ESO Garching, Germany](#)
- ③ [Astronomy and Astrophysics at NSSDC](#) (National Space Science Data Center, USA)
- ③ [Astrovirtual](#)  
"Access and use the ESO/ST-ECF Archive as if it would be a "virtual" Telescope"  
(HST, ESO NTT, VLT, Wide Field Imager on the ESO/MPI 2.2m Telescope)
- ③ [Canadian Astronomy Data Centre \(CADC\)](#)
- ③ [Centre de Donnees astronomiques de Strasbourg \(CDS\)](#), France
  - ③ [VizieR](#), ③ [Aladin](#), ③ [SIMBAD](#), etc.
- ③ [ESO ST-ECF Science Archive Facility](#)
- ③ [High Energy Astrophysics Science Archive Research Center \(HEASARC\)](#) at the Goddard Space Flight Center (GSFC), USA
- ③ [Multimission Archive at STScI \(MAST\)](#) (ASTRO, Copernicus, DSS, EUVE, FIRST, FUSE, HST, IUE, ORFEUS, ROSAT)
- ③ [National Space Science Data Center \(NSSDC\)](#), USA
- ③ [NASA Extragalactic Data Base \(NED\)](#)  
*Please be advised that the digital images of 113 nearby galaxies published by Frei et al. (1996, AJ 111, pp. 174) available from within the NED database have had all foreground stars removed by the authors. See also IAUC 6914.*
- ③ [Sky View](#): images of the sky in many wavelength bands (GSFC, USA)
- ③ [SKYMAP Astronomical Mapping Program](#)  
an interactive astronomical display program which draws a map of the sky. Creation of finder charts is the most common use of skymap.
- ③ [The Journal of Astronomical Data \(JAD\)](#)

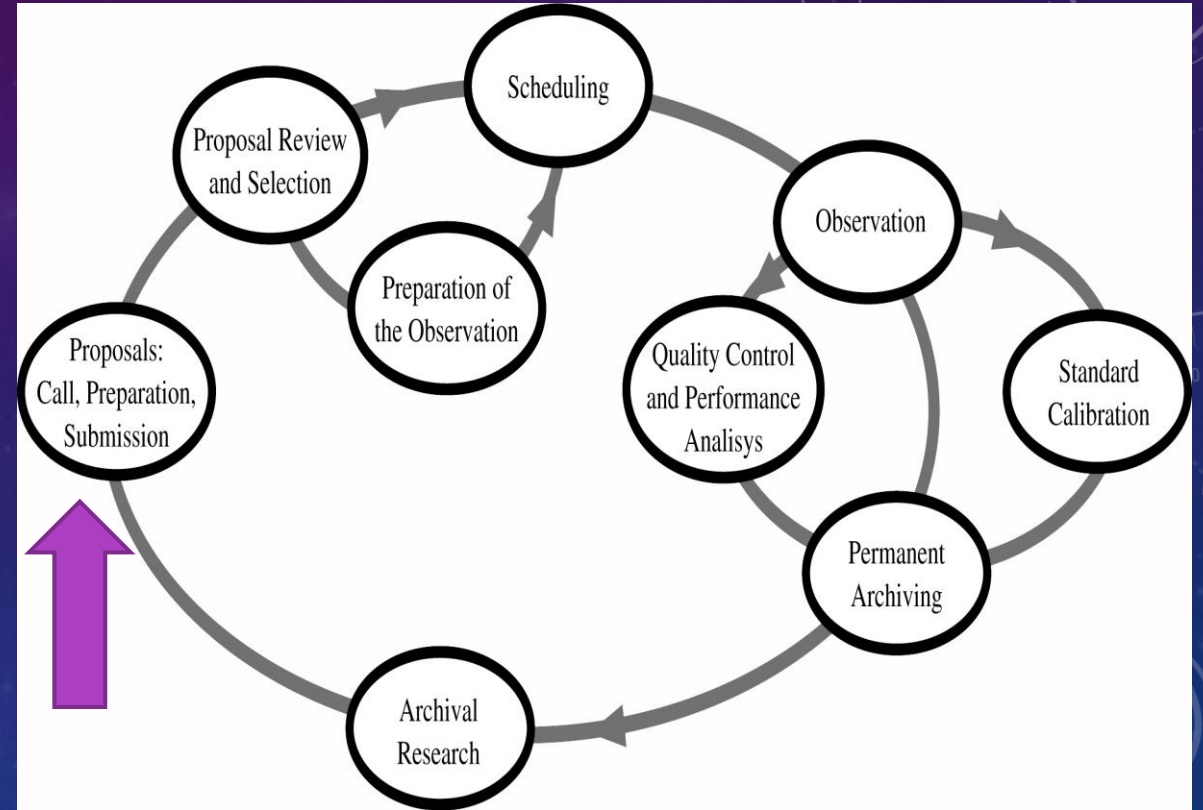
Raw data pubblici (di solito) dopo 1 anno



# RESEARCH DATA LIFE CYCLE

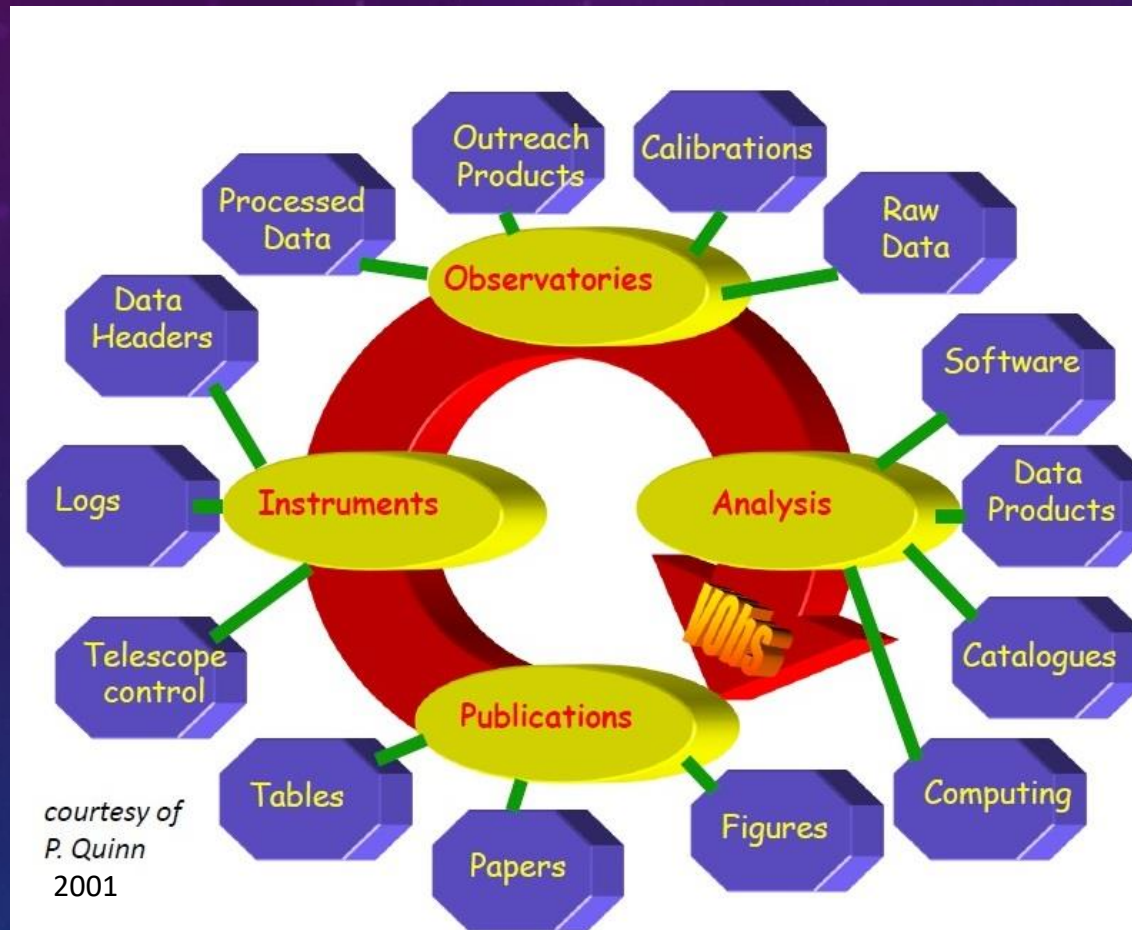


*Courtesy of: M. Locati 2024*



*Courtesy of: di Serego, Pasian et al., 26 Jan 1995*

# VIRTUAL OBSERVATORY (IVOA): UN NUOVO TIPO DI ORGANIZZAZIONE SCIENTIFICA NELL'ERA DELL'ABBONDANZA DELL'INFORMAZIONE



- E' intrinsecamente **distribuito**, ma web-centrico
- Al passo con lo **sviluppo tecnologico**
- Fuori dai classici "cassettini" legato alle particolarita' delle varie lunghezze d'onda..
- E' intrinsecamente **multidisciplinare**
- E' "astronomia democratica"

# IVOA REGISTRY (FAIR DATA)

The screenshot displays the Euro-V0 Registry interface. At the top left, the text "Euro-V0 Registry" is visible. At the top right, the ESA logo is present. Below the header, there is a "SEARCH" section with a "SIMPLE SEARCH" and "ADVANCED SEARCH" option. A search input field contains "M31". A "Managed Authority" dialog box is open in the center, showing a list of 209 selected authorities. The list includes:

- 3crsnapshots
- acastelari
- adil.ncsa
- ads.harvard.edu
- aip.gavo.org
- anusf.anu.au
- aoi.amu.parsec
- aps.umn
- arches
- archive.aavso
- archive.astro.umd
- archive.eso.org

The dialog box also features "Select All", "Clear", and "OK" buttons.



# QUAL'E' LA POLICY?

European Southern Observatory

ESO — Reaching New Heights in Astronomy

Public Science User Portal

Science Users Information > Observing with ESO Telescopes > Policies and Procedures > Publications with ESO Data

28 Oct 2024

Publications based on ESO Data

Based on the FAIR principles to make data Findable, Accessible, Interoperable, and Reusable, publications making use of ESO observational data must include the following statement in a footnote or in the acknowledgement:

***Based on observations collected at the European Southern Observatory under ESO programme(s) TP.C-NNNN(R)\* or PPP.AAAA.nnn\*\* and/or data obtained from the ESO Science Archive Facility with DOI(s) under [https://doi.org/10.18727/archive/NNN\\*\\*\\*](https://doi.org/10.18727/archive/NNN***)***

Telescope Time Allocation

Phase 1 Proposals

Phase 2 Preparation

Phase 3

Public Surveys

Observing Tools and Services

Visiting Astronomers

Science Software

Science Archive Facility

Science Activities

Science Publications

Science and Technical Meetings

IT Services

Library, Documentation & Information Services

Vacancies

Refereed papers that use partly or exclusively data from ESO facilities are included in the ESO Telescope Bibliography (telbib, [telbib.eso.org](http://telbib.eso.org)), a database curated by the ESO Library and Information Centre.

For more detailed information about ESO's data access and acknowledgement policy, please see <https://archive.eso.org/cms/eso-data-access-policy.html>

\* all programmes approved before ESO period 105: **TP.C-NNNN(R)**

T: leading character indicating the programme type (0=Normal, 1=Large, ...)

P: period (2 digits for P<100, 3 digits for P>=100)

C: category (A, B, C, D, L, ...)

NNNN: four digit integer (unique within each semester)

R: run (A, B, ...)

\*\* as of ESO period 105: **PPP.AAAA.nnn**

P: period

A: unique identifier composed of numbers and letters

n: number of the run

Please consult the information on [ESO Programme and Run Identification Codes](#) for further details.

\*\*\* for [ESO Science Archive DOIs](#) (Digital Object Identifiers), please substitute NNN with the correct number from the doi column in the table at <https://archive.eso.org/wdb/wdb/doi/collections/query>

For data obtained from **APEX** and **ALMA**, please also consult the following specific data citation policies:

- APEX: <https://www.apex-telescope.org/ns/apex-data/>
- ALMA: <https://almascience.eso.org/alma-data/publication-acknowledgement>



- DATA
  - SIMBAD 18
  - CDS 10
  - NExSci 9
  - ESO 4
  - MAST 3
  - KOA 2
  - Spitzer 2
  - IRSA

- SIMBAD OBJECTS
  - Other 19
    - K2-18b 19
    - K2-3b 7
    - K2-3d 6
    - K2-3c 5
    - K2-9b 5
  - Star 18
  - Galaxy 1
  - Nebula 1

The screenshot shows the ADS search interface. At the top, there's a search bar with 'object:K2-18b' and a search button. Below the search bar, it says 'Your search returned 25 results'. On the left side, there are filters for 'AUTHORS', 'COLLECTIONS', 'REFEREED', 'AFFILIATIONS', 'KEYWORDS', 'PUBLICATIONS', and 'BIB GROUPS'. The main content area displays a list of search results, including titles like 'Water Vapor on the Habitable-Zone Exoplanet K2-18b', 'An Updated Study of Potential Targets for Ariel', 'Detecting Unresolved Binaries in TESS Data with Speckle Imaging', and 'Discovery of a Third Transiting Planet in the Kepler-47 Circumbinary System'. On the right side, there's a 'Citations' section with a bar chart showing the number of citations for each year from 2015 to 2019, distinguishing between 'refereed' and 'non refereed' papers. The chart shows a steady increase in citations over the period.



# FAIRness via Archival Data Linking

Links to 5 archives with data!

Links to NED and SIMBAD!

Links to Vizier Tables!

Links to paper plots and images!

The screenshot shows the ADS website interface. At the top, there is a search bar with the query `data:(mast irsa ned chandra) bibstem:apj property:associated`. Below the search bar, the title of the paper is displayed: "The Black Hole in the Most Massive Ultracompact Dwarf Galaxy M59-UCD3". The authors listed are Ahn, Christopher P.; Seth, Anil C.; Cappellari, Michele; Krajnović, Davor; Strader, Jay; Voggel, Karina T.; Walsh, Jonelle L.; Bahramian, Arash; Baumgardt, Holger; Brodie, Jean; Chilingarian, Igor; Chomiuk, Laura; den Brok, Mark; Frank, Matthias; Hilker, Michael; McDermid, Richard M.; Mieske, Steffen; Neumayer, Nadine; Nguyen, Dieu D.; Pechetti, Renuka ; ...

On the right side of the page, there are several sections with red circles highlighting specific links:

- FULL TEXT SOURCES**: My Institution, Publisher, arXiv.
- DATA PRODUCTS**: SIMBAD (8) NED (1), MAST (1) IRSA (1), ESA (1) Chandra (1), CDS (1).
- ASSOCIATED WORKS (2)**: Catalog Description, Source Paper.

The main text of the abstract is partially visible, starting with "We examine the internal properties of the most massive ultracompact dwarf galaxy (UCD), M59-UCD3, by combining adaptive-optics-assisted near-IR integral field spectroscopy from Gemini/NIFS and Hubble Space Telescope (HST) imaging. We use the multiband HST imaging to create a mass model that suggests and accounts for the presence of multiple stellar populations and structural components. We combine these mass models with kinematics measurements from Gemini/NIFS to find a best-fit stellar mass-to-light ratio (M/L) and black hole (BH) mass using Jeans anisotropic models (JAMs), axisymmetric Schwarzschild models, and triaxial Schwarzschild models. The best-fit parameters in the JAM and axisymmetric Schwarzschild models have BHs between 2.5 and 5.9 million solar masses. The triaxial Schwarzschild models point toward a similar BH mass but show a minimum  $\chi^2$  at a BH mass of  $\sim 0$ . Models with a BH in all three techniques provide better fits to the central  $V_{rms}$  profiles, and thus we estimate the BH mass to be  $\{4.2\}_{-1.7}^{+2.1} \times \{10\}^6 M_{\odot}$  (estimated  $1\sigma$  uncertainties). We also present deep radio imaging of M59-UCD3 and two other UCDs in Virgo with dynamical BH mass measurements, and we compare these to X-ray measurements to check for consistency with the fundamental plane of BH accretion. We detect faint radio emission in M59cO but find only upper limits for M60-UCD1 and M59-UCD3 despite X-ray detections in both these sources. The BH mass and nuclear light profile of M59-UCD3 suggest that it is the tidally stripped remnant of a  $\sim 10^8$   $10^{10} M_{\odot}$  galaxy.

## Example of Data Mention: Scolnic et al, ApJ 859, 101

ApJ paper has DOI 10.17909/t95q4x linked under “Article data” tab.

DOI 10.17909/t95q4x is mentioned 7 times in HTML and PDF document:

- Narrative (3 times)
- Table captions (3 times)
- Appendix A (data & code availability, 1 time)

However, there is no citation for it

THE ASTROPHYSICAL JOURNAL

The Complete Light-curve Sample of Spectroscopically Confirmed SNe Ia from Pan-STARRS1 and Cosmological Constraints from the Combined Pantheon Sample

D. M. Scolnic<sup>1,2†</sup>, D. O. Jones<sup>2</sup>, A. Rest<sup>2,3</sup>, Y. C. Pan<sup>4</sup>, R. Chornock<sup>5</sup>, R. J. Foley<sup>4</sup>, M. E. Huber<sup>6</sup>, R. Kessler<sup>1</sup>, G. Narayan<sup>3</sup>, A. G. Riess<sup>3,2</sup> + Show full author list

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[The Astrophysical Journal, Volume 859, Number 2](#)

Article PDF Article ePub

Figures Tables References Article data

External repository

MAST dataset

What is article data?

Appendix A: Data Tables and Code Repository

Upon publication, we will release [doi:10.17909/t95q4x](https://doi.org/10.17909/t95q4x), a set of data files, coding routines, and supplementary tables to replicate this analysis. This includes the following:

1. A table of the spectroscopic observations of each SN in the PS1 sample that includes their ID, date of observation, telescope observed and measured redshift. A shortened version is included below in Table 15.
2. A table of key recovered parameters from the light-curve fits for the full Pantheon sample. A shortened version of this is shown below in Table 16. We also include a full output table from the SNANA fitter of a thorough listing of fitted parameters and other properties of the light curves. Final redshifts and distances are also given—a shortened version is shown in Table 17.
3. A table of binned distance estimates over redshift for a compressed version of the data set.
4. A full systematic covariance matrix for the binned and unbinned versions.
5. Stellar catalogs of the MD fields.
6. Necessary files to use with the CosmoMC or CosmoSIS software with instructions.
7. A folder of all the SNANA set-up scripts to fit each sample. A folder of all the SNANA set-up scripts to simulate each sample.
8. Output tables for 30 simulated samples used to test external methods and perform null tests on this data set.
9. Code for remaking all figures in this paper.

Abstract

1. Introduction
2. The PS1 Search, Photometry, and Calibration Pipeline
3. PS1 Light-curve Fitting and Simulation
4. Combining Multiple SN Samples
5. Analysis Framework
6. Results
7. Discussion
8. Conclusion

Appendix A: Data Tables and Code Repository

Appendix B: Template Construction

Appendix C: Low-z Simulations

Footnotes

References

# A COSA DARE IL DOI ?

Cos'è un dataset:

a raccolta strutturata di dati organizzati e archiviati per l'analisi o l'elaborazione.

Telescopi generalmente hanno dei programmi osservativi concorrenti. Il loro archivio potrebbe assegnare un DOI ad ogni set di dati derivanti dal un ben determinato programma osservativo.

Grandi survey:?

Gaia telescope: DB da ~ 1 PB

SKA Telescope: Archivio previsto > ExaB



# CONCLUSIONE

- Sistemare i dati → Creare un dataset FAIRable → tempo, organizzazione, infrastruttura
- Nell'ultima VQR i dataset erano inseribili come "Prodotti" (valutazione ??)
- L'acquisizione di crediti influenza il grado e la modalità di condivisione.
- Il sistema di valutazione potrebbe impedire la condivisione dei dati attraverso la sottovalutazione del lavoro scientifico come contributori.