



ANNUAL REPORT **2020**

NUMFOCUS
OPEN CODE = BETTER SCIENCE

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LETTER FROM THE EXECUTIVE DIRECTOR

NumFOCUS, like most organizations, was greatly impacted by COVID-19 and the uncertainties of 2020. As we joined the world in focusing our efforts to stay healthy and safe, we also proactively worked to ensure our projects and community received uninterrupted services. Grants were awarded and managed; developers were paid; legal services were extended, and events and workshops were organized.

NumFOCUS project contributors not only maintained but also innovated. Their efforts played an integral role in meeting the needs of researchers and data scientists working to combat COVID-19. Our projects were foundational in analyzing, modeling, and visualizing crucial data. Research relying on our tools helped to drive government and industry decision-making and response planning.

Adaptability was key in 2020. NumFOCUS's educational initiatives paused only briefly to regroup before transitioning to online event formats. The creativity and tenacity of our community volunteers and event staff were impressive as talks, tutorials, and networking opportunities were delivered to 14,583 virtual attendees. NumFOCUS's annual Project Summit transitioned to online workshops including optimizing community engagement, survey design, obtaining government R&D funding, and a legal Q&A.

Two exciting programs were launched this year through the generous support of two of our grantors. The Alfred P. Sloan Foundation funded the initial build-out and deployment of the NumFOCUS Academy, our new online learning platform aimed at broadening the reach of our educational services. JupyterCon and PyData Global were the first use-cases, kicking off an ambitious program to re-envision conferences as a learning platform. As diversity, equity, and inclusion continues to be at the forefront of our values, we were thrilled to be awarded a grant from The Gordon and Betty Moore Foundation to launch our Contributor Diversification and Retention Research Program. This project lays the groundwork for understanding which practices and metrics impact a project's success in attracting and retaining underrepresented contributors. Our ultimate goal is improved diversity, equity, and inclusion within NumFOCUS project communities and the sharing of learned outcomes with the wider open source community.

2020 has been a year of organizational growth. We strategized to adapt to the current climate while examining how to provide a stronger service network for our projects. Throughout the year, the strength and support of our internal and external stakeholders was unwavering. For this, we are profoundly grateful and humbled. We look forward to your involvement in 2021.

Sincerely,
Leah Silen, Executive Director



LEAH SILEN

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but also innovated.
Their efforts played
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2020 AT A GLANCE

Projects

84

SPONSORED &
AFFILIATED PROJECTS

22

NEW PROJECTS

1,458

SPONSORED PROJECT
CONTRIBUTORS IN 2020

Fundraising

\$615,343

CORPORATE DONATIONS

\$140,469

INDIVIDUAL DONATIONS

763

INDIVIDUAL DONORS

Events

14,583

PARTICIPATING IN NF COMMUNITY
VIRTUAL EVENTS

497

ONLINE TALKS & TUTORIALS
GIVEN BY NF COMMUNITY

429

TOTAL NUMBER OF
MEETUP EVENTS

Social

170,314

GLOBAL MEETUP MEMBERSHIP

470K

NF COMMUNITY & PROJECT
TWITTER REACH

20%

PYDATA YOUTUBE SUBSCRIBER
GROWTH IN 2020

Impact in 2020

NUMFOCUS & COVID-19

Open source tools are uniquely positioned to help combat the ongoing COVID-19 pandemic through their adaptable and collaborative nature. NumFOCUS sponsored and affiliated projects have been used on a global scale to meet the needs of researchers and data scientists. This work includes groundbreaking scientific efforts to create response models, visualize and analyze patient data, monitor the effects of lockdown, and simulate hospital capacities for local governments.

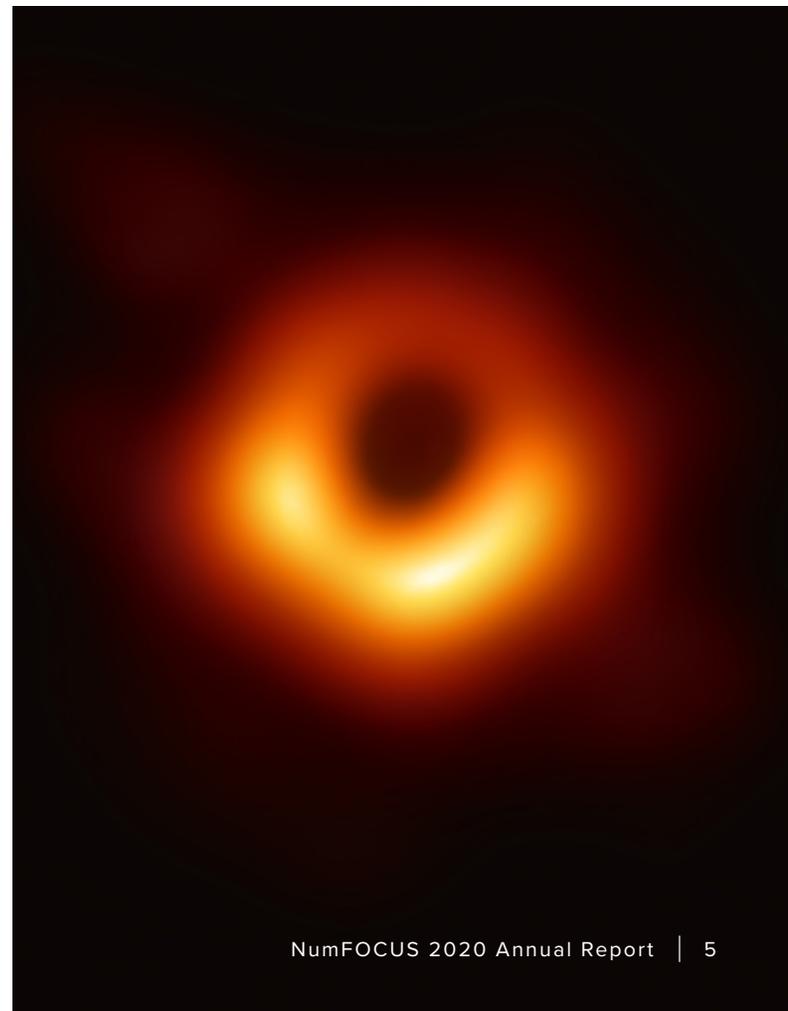
[Read more on our blog](#)

NOBEL PRIZE USE CASE



NumFOCUS Projects are at the forefront of scientific research and discovery. This year, the Nobel Prize in Physics was awarded to Roger Penrose, Reinhard Genzel, and Andrea Ghez “for the discovery that black hole formation is a robust prediction of the general theory of relativity.”

Andrea Ghez’s groundbreaking achievement was made possible by a number of NumFOCUS projects including NumPy, SciPy, and Matplotlib. NumFOCUS is in the process of collating how our projects were used in this work and we’ll be publishing a case study in 2021.



SUPPORTING PROJECTS DURING UNPRECEDENTED TIMES

Projects speak to the impact of NumFOCUS in 2020:



MDAnalysis

“By becoming a NumFOCUS sponsored project, we are showing to users and funders a long-term commitment to maintaining and developing the MDAnalysis project. Access to NumFOCUS small development grants to pay for developer time was important to address critical issues. The expertise of NumFOCUS in legal matters and developing proposals for open source projects are resources that we did not have access to previously, which help us to become more professional without overburdening developers and maintainers who can still concentrate on the scientific and community aspects of the project. Finally, NumFOCUS, through its general conference calls and the annual summit, creates a lively forum with leading open source projects that teach and inspire us.”



Bokeh

“Our relationship with NumFocus has provided financial assistance, as well as fundraising and accounting guidance, that make a huge difference in the long-term sustainability of a project like Bokeh. The Summit sessions have also been a great resource for project management information and inspiration.”



rOpenSci

“NumFOCUS Small Development Grants enabled us to hire an experienced R programmer and scientist to work as a Community Assistant one day a week. She helps maintain successful programs like our community calls and blog that bring attention to and educate scientists who are using open source software, and she has co-authored our new rOpenSci Community Contributing Guide.”



Matplotlib

“Matplotlib has been fortunate to receive funding from Chan-Zuckerberg Initiative to support both ongoing maintenance and a PhD who is investigating new data pipelines for the library. Because the Matplotlib developers are all from different nations and institutions, NumFOCUS has provided a crucial umbrella entity we can work with to administer this grant (which was just renewed!). NumFOCUS also supported a Google Summer of Code internship and funded the creation of new and handy Matplotlib cheatsheets (<https://github.com/matplotlib/cheatsheets>).”



conda-forge

“NumFOCUS has provided conda-forge with the operational, financial, and legal expertise it needs to continue to enhance what it can offer to the community. This support helped to enable a year of huge growth for conda-forge and its ecosystem through AWS credits, small development grants, and donations.”



JuMP

“NumFOCUS has been essential for the sustainability of JuMP by providing a framework for core contributors to receive funding from grants.”



Shogun

“NumFocus has provided great publicity for us. As a small project among very big (corporate) players, this has attracted a stream of potentially new contributors and users.”



Stan

“NumFOCUS offers the Stan project valuable structure and access to high-quality advice on important topics like financial governance, community standards, and contract management. Because of our NumFOCUS sponsorship, we can spend more time focused on our mission of creating software that can tackle the toughest problems in Bayesian statistics.”

Projects

NUMFOCUS WELCOMED 8 NEW SPONSORED AND 15 NEW AFFILIATED PROJECTS IN 2020.

SPONSORED



MDAnalysis

MDAnalysis is a Python library for the analysis of computer simulations of many-body systems at the molecular scale, spanning use cases from interactions of drugs with proteins to novel materials. It is widely used in the scientific community and is written by scientists for scientists.



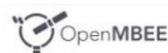
ITK

ITK is an open-source, cross-platform library that provides developers with an extensive suite of software tools for image analysis. Developed through extreme programming methodologies, ITK builds on a proven, spatially-oriented architecture for processing, segmentation, and registration of scientific images in two, three, or more dimensions.



scikit-image

scikit-image aims to be the reference library for scientific image analysis in Python. It is a collection of algorithms for image processing and analysis, including functions for filtering, feature extraction, segmentation, measurement, and more. It is designed to work seamlessly within the scientific Python ecosystem, including the NumPy and SciPy libraries.



OpenMBEE

OpenMBEE is a community of Engineering Practitioners and Software Developers that seek to use Open Source as a means to expand the availability of Engineering Models and Software that connect technical information in a collaborative platform.



scikit-learn

scikit-learn is a Python library for machine learning, and is one of the most widely used tools for supervised and unsupervised machine learning. scikit-learn provides an easy-to-use, consistent interface to a large collection of machine learning models, as well as tools for model evaluation and data preparation.



Arviz

Arviz is a unified codebase for Exploratory analysis of Bayesian models. It includes functions for posterior analysis, data storage, sample diagnostics, model checking, and comparison.



SciML

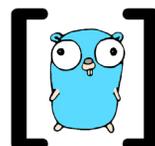
SciML is an open source software organization created to unify the packages for scientific machine learning. This includes the development of modular scientific simulation support software, such as differential equation solvers, along with the methodologies for inverse problems and automated model discovery. By providing a diverse set of tools with a common interface, we provide a modular, easily-extendable, and highly performant ecosystem for handling a wide variety of scientific simulations.



TARDIS

TARDIS is a collection of tools to analyze observations from exploding stars and is widely adopted in the astrophysical community for cutting edge science. TARDIS is a multi-disciplinary collaboration applying new tools from artificial intelligence research and high-performance computing with an open-source development structure.

AFFILIATED



Gonum



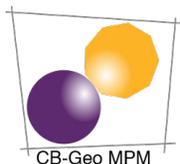
poliastro



NetworkX



GEOMSCALE



CB-Geo MPM



Taskflow

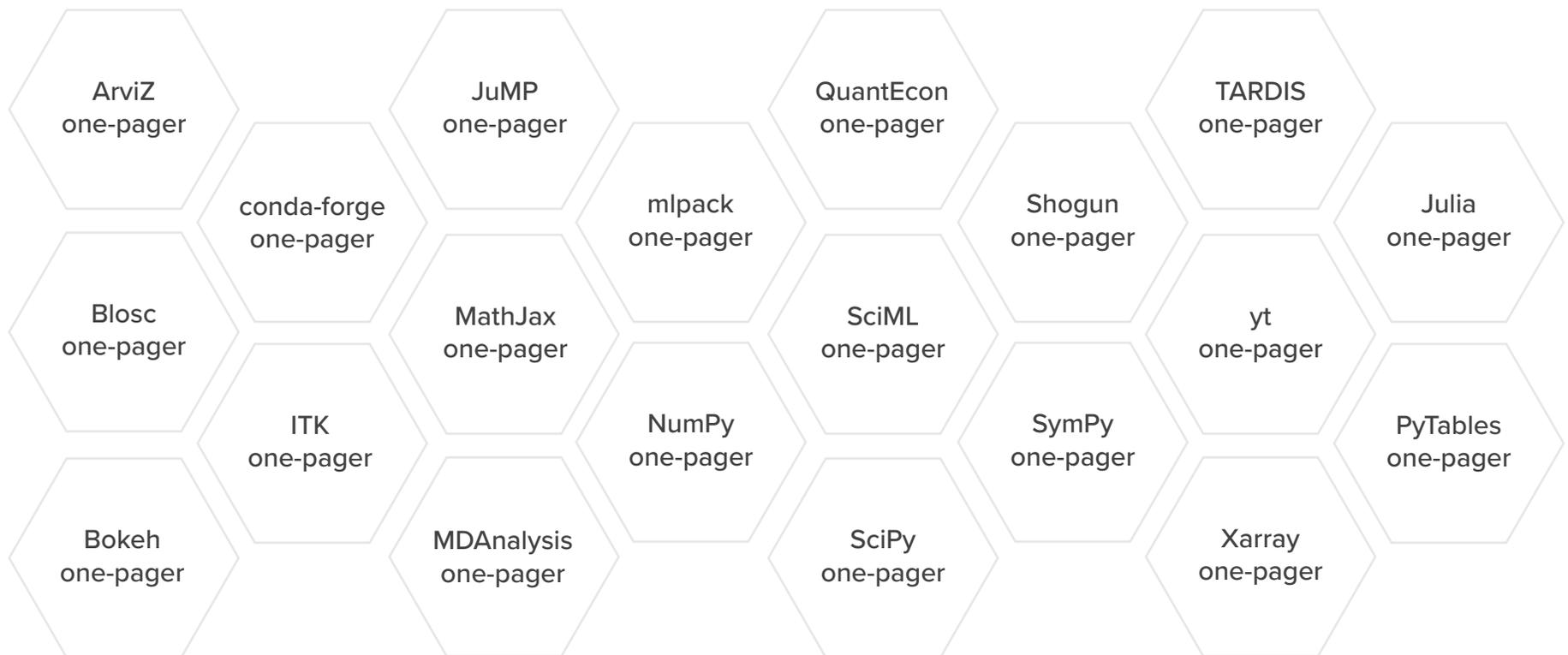


sgkit

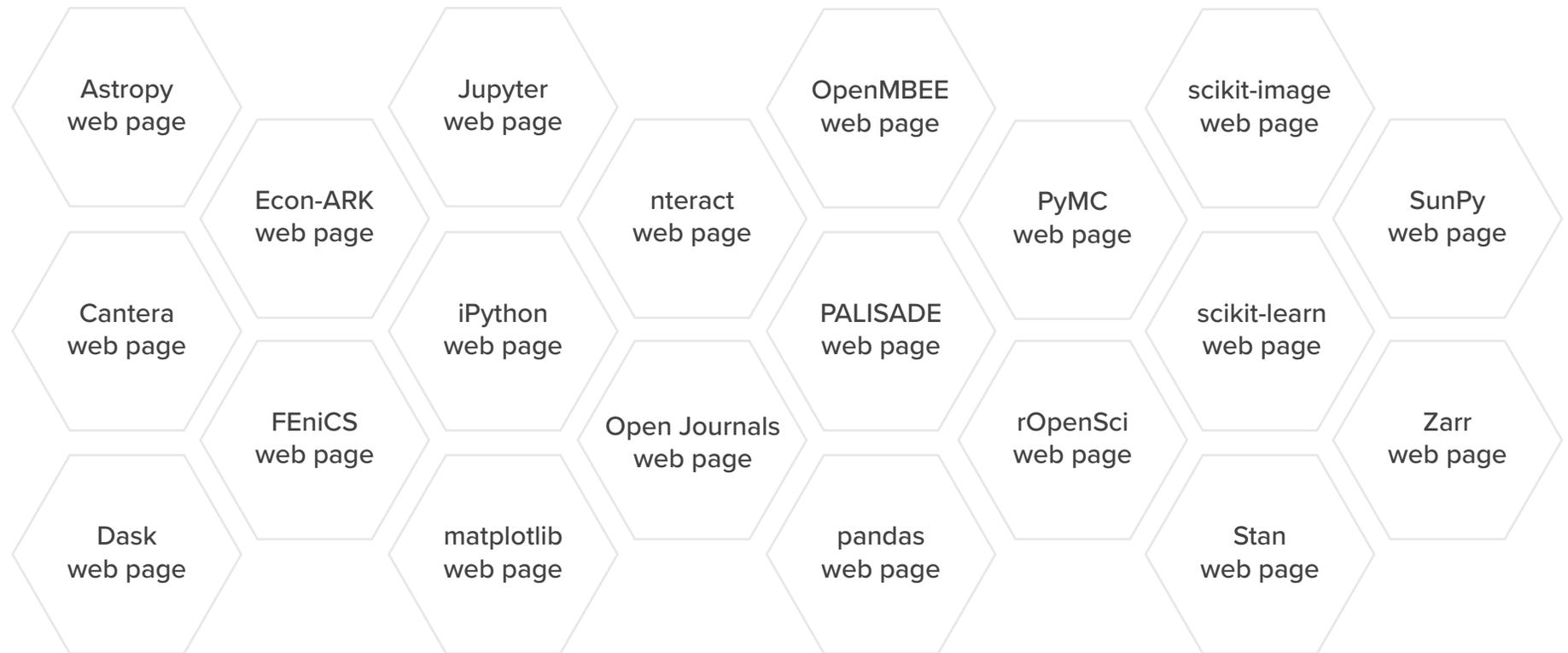
PROJECT ONE-PAGERS

NumFOCUS Projects are used in a myriad of applications and domains. This year we're working with sponsored projects to develop one-pagers that offer a high-level overview to those with little to no prior knowledge of a project. These abstracts will also serve those looking for a quick summary of project highlights. This process is still ongoing and we hope by the end of 2021 we'll have a one-pager available for every project.

For more information on a specific project, follow the link to their one-pager below.



One pagers for these projects have not been developed yet. For more information, you can click to visit their project page.



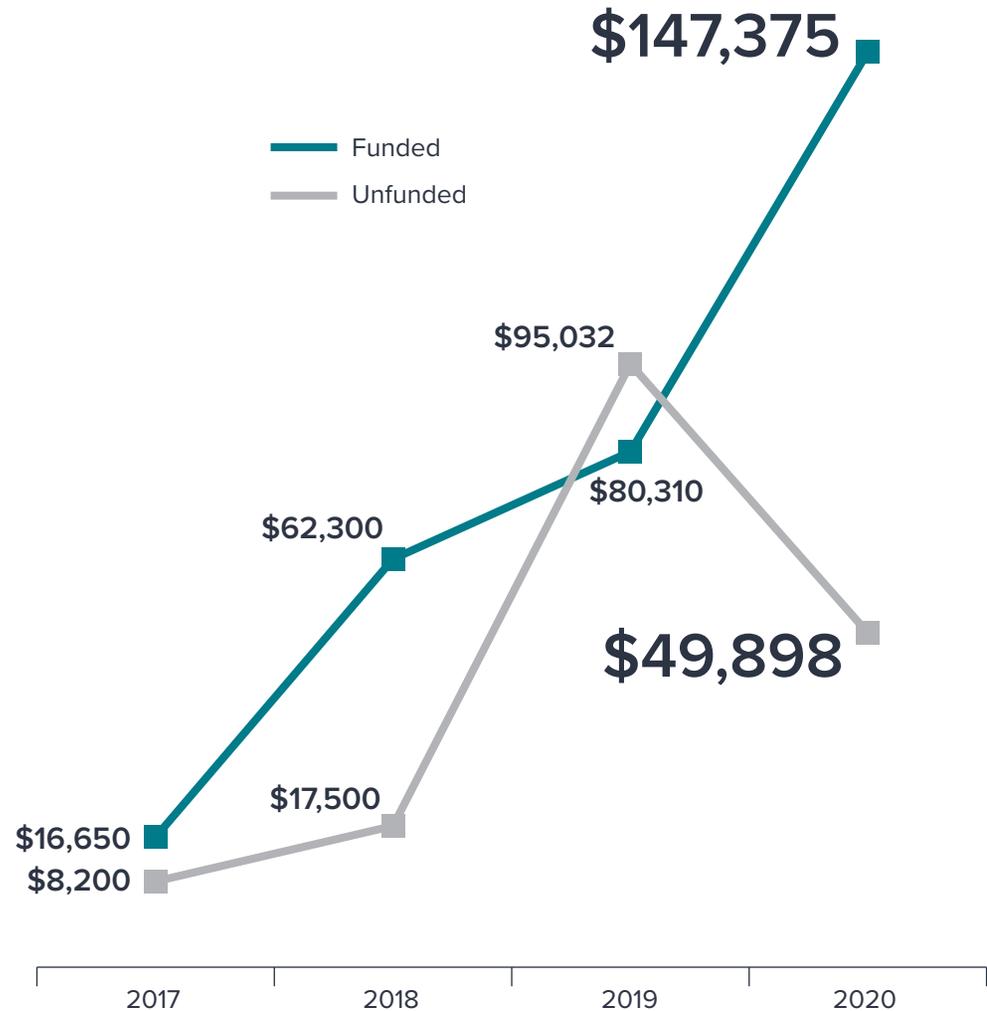
Grants

SMALL DEVELOPMENT GRANTS

NumFOCUS provides projects with Small Development Grants (SDGs) to fund small initiatives that otherwise might not receive funding. In 2019 we had far more requests than available funding. This year, despite the pandemic, NumFOCUS was able to fund a record amount of SDGs, nearly doubling last year's amount and cutting down significantly on unfunded requests.

As the number of NumFOCUS project's continues to grow, we will increase funding to match the needs of our projects. Funding for this initiative comes directly from you, our corporate and individual donors.

IN 2020 WE INCREASED GRANT FUNDING BY 54%



INCREASING CONTRIBUTOR DIVERSITY

In 2020 NumFOCUS announced the launch of our Contributor Diversification & Retention Research Project funded by a grant from the Gordon and Betty Moore Foundation. The impact of this critical research will be felt by all NumFOCUS projects as we take an active step to address the lack of underrepresented groups contributing to foundational open source scientific computing projects. Managing the program will be NumFOCUS's new Developer Advocate, Arliss Collins. Arliss will be assisted by NumFOCUS Communications and Marketing Manager, Walker Chabbott, and Quantitative Research & Survey Consultant, Abdul Coulibaly.

The project will be completed within 2 years and produce the following outcomes:

- Report on baseline diversity demographics among NumFOCUS contributor communities (Year 1)
- Report on historical community practices and metrics that are correlated with the ability to attract and retain underrepresented contributors (Year 1)
- Preliminary recommendations on best practices around diversity & inclusion for project leaders, to be distributed to the wider open source community (Year 2)

Full Announcement:

<https://numfocus.org/diversity-inclusion-disc/a-pivotal-time-in-numfocuss-project-aimed-dei-efforts>



IMPACTFUL COMPREHENSIVE SUPPORT

NumFOCUS received a general support grant from the Heising-Simons Foundation which ensured we had resources available for critical needs. To support our scientific computing projects and their user communities funding was applied across our three primary service areas:

- Crucial support services provided daily to our projects including financial administration, grants management, legal and operational services, and promotional support
- Direct funding to projects through our Small Development Grants program
- Community education, engagement, and DEI initiatives.

As a new grantor, their comprehensive support ensured our services continued uninterrupted. We thank Heising Simons Foundation for their dedication to the NumFOCUS community.



PROJECT GRANTS

**Chan
Zuckerberg
Initiative** 

\$1,395,000.00 total



\$275,000.00



\$15,000.00



Alfred P. Sloan
FOUNDATION

\$379,500.00



Open Journals



\$35,191.00



Two initiatives to bring flagship educational programs online

EXPANDING THE SCOPE OF NUMFOCUS'S EDUCATIONAL MISSION



**Alfred P. Sloan
FOUNDATION**

A generous grant from the Alfred P. Sloan Foundation funded the initial build-out and deployment of NumFOCUS Academy's digital infrastructure and customized Open edX platform. This exciting new educational project launches a comprehensive platform for online courses, e-commerce tools, a Jupyter/Binder server to deliver interactive labs, and data-analytic machinery to engage learners while connecting them with content and opportunities.

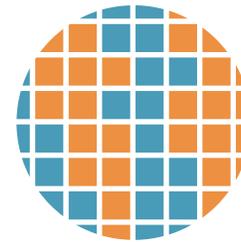
The platform also serves as an avenue for running online events, a use-case kicked off in 2020 by JupyterCon and PyData Global. This reimagining of virtual events combines the online conference, the curriculum of advanced scientific computing, and an interactive tutorial or lab environment into a single platform.

As we continue NumFOCUS Academy's development in 2021 we look forward to offering data-driven learner engagement through courses and certifications on all matters related to NumFOCUS projects, and reproducible data science.

INCREASING GEOGRAPHIC DIVERSITY THROUGH PYDATA GLOBAL

2020 brought abrupt and unexpected change to much of our community: social distancing, closed schools, travel restrictions and curfews to name a few. During those times of uncertainty, we thought it more important than ever to continue to find ways to bring the community together to learn and interact with one another and to do so in ways that leveraged the benefits of online technology while keeping intact the community engagement our events are known for.

The marketing for PyData Global was specifically tailored to our international community. This included a scaled pricing model that was based on the attendee's geographic location. This made the event both inclusive and affordable to all participants and led to record attendance for a PyData event. PyData Global also ran on a 24 hour schedule with speakers, participants and volunteers from all over the world working together to provide an experience that wasn't tailored to a single timezone.



PyData
Global

1,960

ATTENDEES

165

SPEAKERS

109

PRESENTATIONS

98

DIVERSITY
SCHOLARSHIPS

PROJECT EVENT SPOTLIGHT

Cancellations of in-person gatherings gave NumFOCUS projects an opportunity to extend their reach to those who have been unable to attend in-person events. Through online forums projects were able to share knowledge during a time of physical distancing.

jupyterCON

JupyterCon had to pivot to a virtual event this year. This was the first event to use the new Academy platform. This event was able to raise funds for both Project Jupyter and NumFOCUS to pay for operational costs to keep NumFOCUS healthy and continuing to support the open source community.

150

SPEAKERS

juliacon

JuliaCon expanded its reach within the community by organizing a free online event to anyone around the world which facilitated over 10,000 community members to register for the event. The event enabled many community members to engage in the Julia community that have otherwise been unable to attend the in-person conferences.

+10K

ATTENDEES



Continuing on their previous event successes, the StanCon community held another great conference. They were able to raise funds for the Stan community but continued to remain accessible by funding 39 diversity scholarships which made up 11% of total attendees.

39

DIVERSITY SCHOLARSHIPS



PyMCon hosted its first online conference this year, setting a foundation to build on in future years. Talks and tutorials were presented by 40 speakers to 240 attendees.

\$14K

RAISED AT ZERO COST

VIRTUAL MEETUPS AND COLLABORATIONS

For years, PyData Meetups have been an opportunity for our local leaders to bring the community together to learn and socialize with one another. Early in 2020 the opportunities to host in-person events were abruptly ended. Yet despite the challenges, community leaders continued to provide learning opportunities and social interactions through new and creative online forums.

With a physical location no longer a limiting factor, local Meetup organizers established new and creative opportunities for community participation from members around the world. For the first time, chapter organizers also collaborated with one another to host joint Meetups, demonstrating the growth and sophistication we have seen in the PyData community over the years.

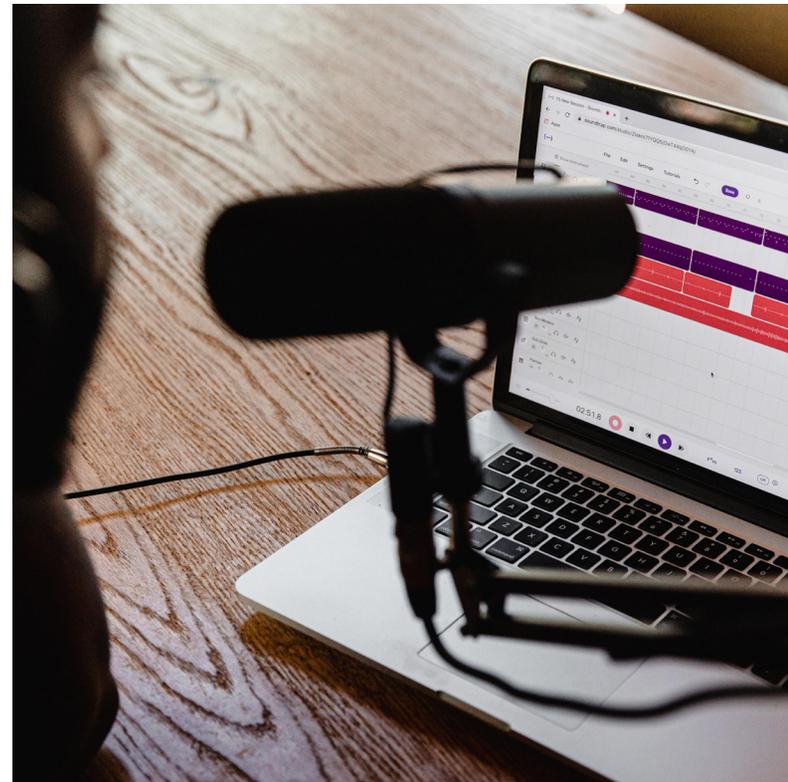
TOTAL MEETUP NUMBERS

423

TOTAL VIRTUAL EVENTS

29,650

RSVPS



Building and fortifying our network of support

CORPORATE SPONSORS

Our corporate partners continued to play a pivotal role in our support network in 2020, helping us to navigate a challenging year. The NumFOCUS ecosystem benefitted from generous annual corporate gifts as well as company matches of employee donations and volunteer hours. We thank our corporate sponsors for investing in our mission to support open source scientific computing.

Bloomberg



COILED



INDIVIDUAL DONORS – OPEN SCIENCE CHAMPIONS

In July, NumFOCUS introduced Open Science Champions, a program highlighting individual members of our community who are supporting our mission. Among its objectives, the program aims to improve recognition of our donors, volunteers, and advocates while integrating the different forms of support our individual community members provide.

The launch of the program was met with much enthusiasm and helped to set the pace for a record year of individual donations and other support for NumFOCUS and our projects. We look forward to connecting more Champions to our mission in 2021.

A special thanks to the following Open Science Champions who sponsored the program's launch:

Safia Abdalla

Eric Dill

Ahmet Erdemir

Eric Jankowski

Ryan McCorvie

Nathan Shammah

Rachel Slaybaugh

Ian Stokes-Rees

Cedric Yau

OtoJig GmbH (Corporate Partner)

plus 2 anonymous sponsors



For a complete list of our individual donors in 2020 please visit our [Open Science Champions web page](#).

766

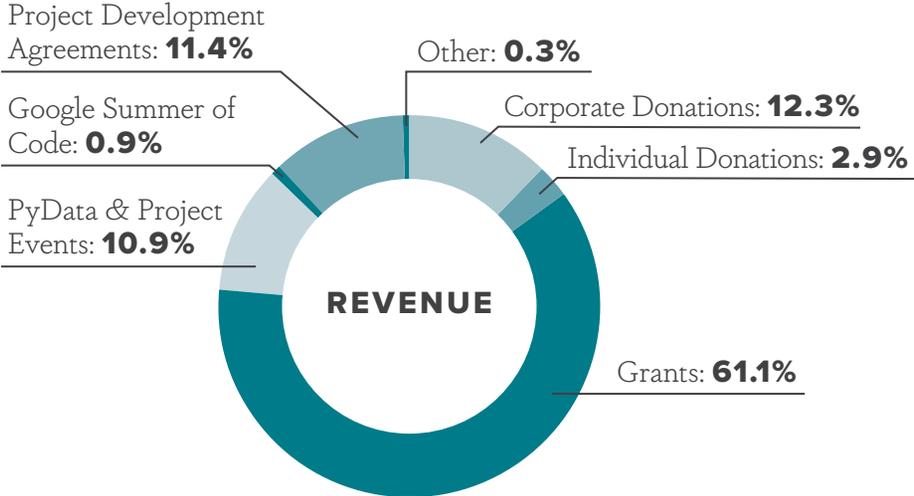
INDIVIDUAL DONORS

\$140,469

TOTAL DONATIONS

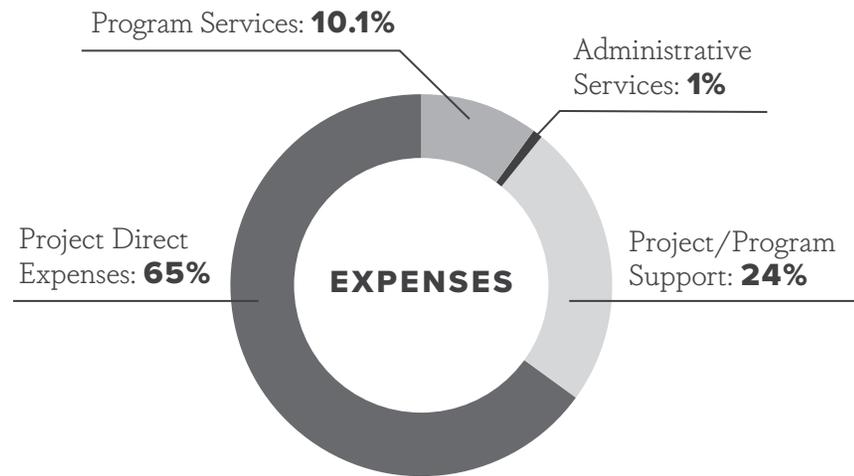
Financials

REVENUE



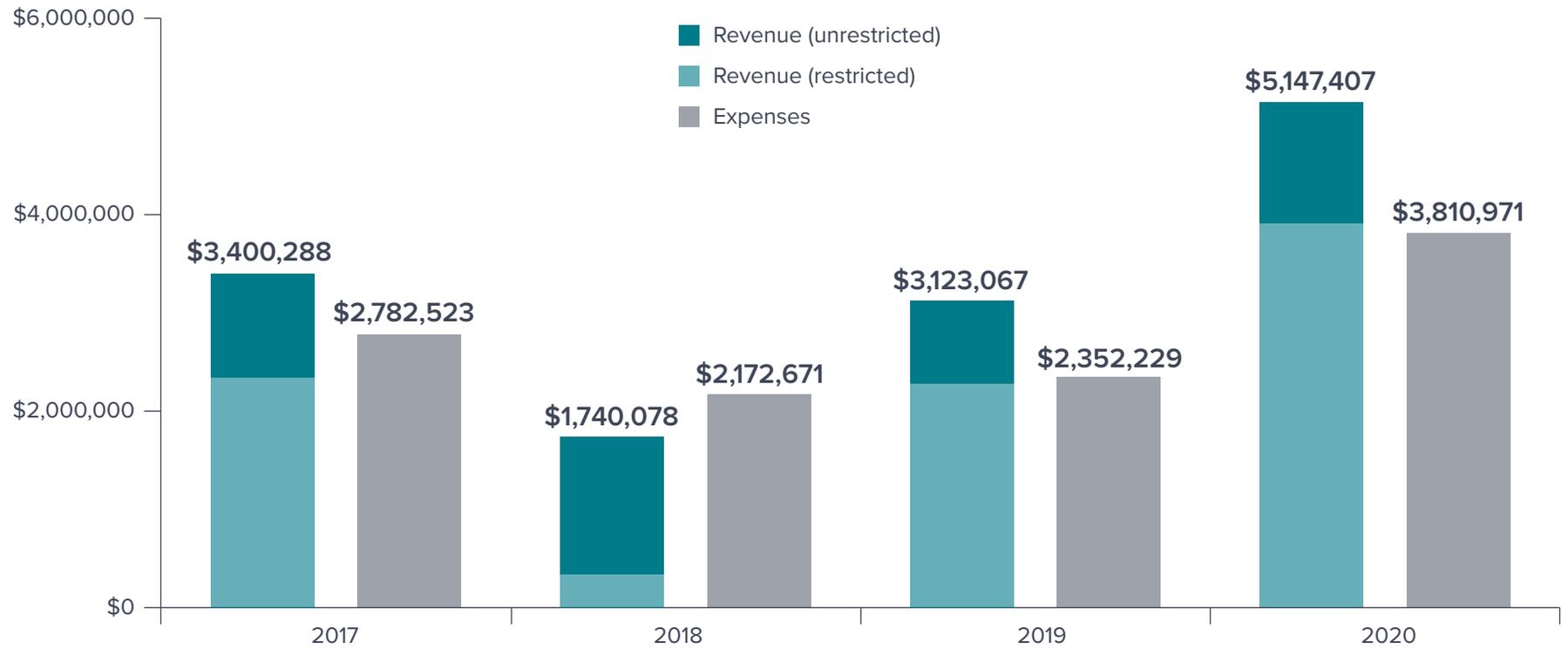
REVENUE*	\$5,140,483.54
Corporate Donations	\$633,334.23
Individual Donations	\$140,469.00
Grants	\$3,154,332.00
PyData & Project Events	\$564,627.81
Google Summer of Code	\$45,000.00
Project Development Agreements	\$589,780.83
Merchandise Sales	\$5,809.73
Interest	\$7,129.94
*Restricted for projects and programs	\$3,916,700.00

EXPENSES



EXPENSES	\$3,810,970.63
Program Services	\$383,535.44
Diversity Scholarship (External Event)	\$6,000.00
PyData and Project Events	\$222,410.96
Promotional Services	\$3,572.09
Small Development Grants	\$150,000.00
Travel	\$1,552.39
Administrative Services	\$37,377.34
Bank Fees	\$10,239.09
Insurance	\$3,263.00
Rent, Equipment, & Supplies	\$14,926.39
Fundraising	\$6,966.16
Software & Subscriptions	\$1,982.70
Project/Program Support	\$913,509.75
Legal, Accounting, & Other Professional Services	\$245,416.92
Software & Subscriptions	\$62,477.04
Staff Salary/Benefits	\$605,615.79
Project Direct Expenses	\$2,476,548.10
Admin Fees	\$333,250.46
Advertising/Promotional	\$2,038.55
Awards/Gifts	\$7,000.00
Conferences & Workshops	\$28,874.20
Contractors/Subcontractors (development/maintenance/websites)	\$2,036,265.98
Equipment/Supplies	\$6,964.12
Summer of Code Programs	\$14,000.00
Software & Subscriptions	\$26,052.00
Travel	\$22,102.79

REVENUE & EXPENSE COMPARISON 2017-2020



2020 PROJECT INCOME

\$0-5K

\$5K-100K

\$100K+

EOY ALL DATES BALANCE

\$0-5K

\$5K-100K

\$100K+

People

NUMFOCUS STAFF

Leah Silen
Executive Director

Arliss Collins
Open Source Developer Advocate

Terry Foor
Director of Development

Lynn Brubaker
Project Finance Manager

Jim Weiss
Events Manager

Nicole Foster
Operations Administrator

Walker Chabbott
Community Communications &
Marketing Manager

Lisa Martin
Financial Administrator

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Rosie Pongracz (IBM)

Peter Wang (Anaconda)

Cedric Yau

Mission: The mission of NumFOCUS is to promote open practices in research, data, and scientific computing by serving as a fiscal sponsor for open source projects and organizing community-driven educational programs. NumFOCUS is a 501(c)(3) public charity in the United States.

Vision: NumFOCUS envisions an inclusive scientific and research community that utilizes actively supported open source software to make impactful discoveries for a better world.

[LEARN MORE](#)

NUMFOCUS

OPEN CODE = BETTER SCIENCE

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