

Demonstrated support

FAPESP has continued to invest in research despite the economic downturn, according to its *2014 Annual Activity Report*

Fabício Marques

PUBLISHED IN AUGUST 2015

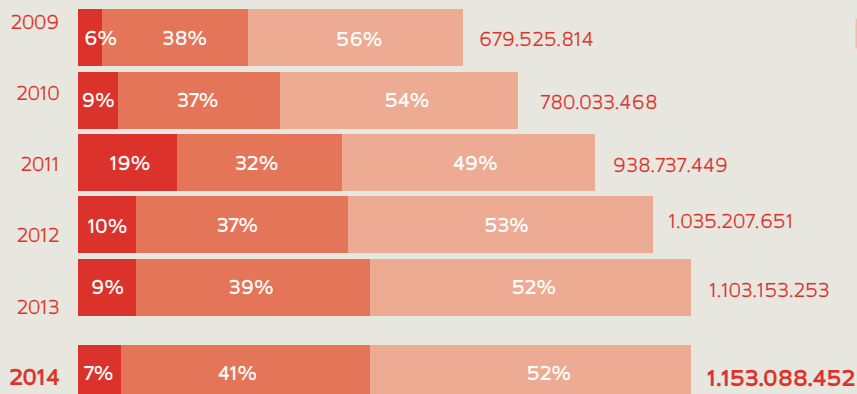
FAPESP invested R\$1,153 billion in research funding in 2014, more than the R\$1,103 billion in outlays it disbursed in 2013. This achievement is one of the highlights of the *2014 Annual Activity Report* released at the Foundation's headquarters on July 22, 2015, together with an exhibition of reproductions of the works by Brazilian artist Maria Bonomi that illustrate the publication. Foundation income totaled R\$1,222 billion in 2014, which was 5% greater than 2013, in current prices. Of this total, 81.7% came from transfers from the São Paulo State Treasury — under the São Paulo State Constitution, FAPESP receives 1% of all state tax revenue. Other sources (agreements with other funding agencies, companies and higher education and research institutions in Brazil and abroad) accounted for 12.2%. The remaining 6.1% came from the Foundation's own financial revenue. As stipulated in its statute,

FAPESP must hold assets that produce income for investment in the funding of research to supplement the transfers received from the State Treasury. "Despite the economic slowdown and the resulting decrease in the state's tax revenue in 2014, FAPESP was able to meet its commitments and fulfill its mission to support the development of research for the benefit of our state," said FAPESP President Celso Lafer.

The full text of the 2014 report and editions from previous years are available (in Portuguese) at: www.fapesp.br/publicacoes/. "Facilitating the visibility of its activities is essential to FAPESP, which is one of the few organizations in Brazil that offers taxpayers annual activity reports accessible by Internet, as FAPESP has done since its establishment in 1962," said the Foundation's Scientific Director, Carlos Henrique de Brito Cruz. In recent years, key modifications in the profile of FAPESP expen-

Advances in investment

Evolution of FAPESP funding disbursements in the 2009-2014 period (in R\$), and the percentage share of each funding objective



SUPPORT TO APPLICATION-DRIVEN RESEARCH

Biota-FAPESP Program; FAPESP Bioenergy Research Program (BIOEN); FAPESP Research Program on Global Climate Change (RPGCC); Research, Innovation and Dissemination Centers (RIDC); Inter-institutional Cooperation in Support Brain Research (CInAPCe); FAPESP Research Program on eScience (eScience); Grants and fellowships in the fields of engineering, health, agronomy and veterinary sciences; Public Education Research Program; Science Journalism (MídiaCiência); Public Policy Research Programs: Research in Public Policies and Research in Public Policies for the National Healthcare System (PP-SUS); Programs to support innovative research in micro and small businesses: Innovative Research in Small Businesses Program (PIPE), Small Business Research Programs (Phase 3 PIPE: PAPPE/FINEP); Research Partnership for Technological Innovation: Research Partnership for Technological Innovation (PITE), Research Partnership for Technological Innovation—SUS (PITE-SUS); Support to Intellectual Property Rights and Licensing (PAPI/NUPLITEC)

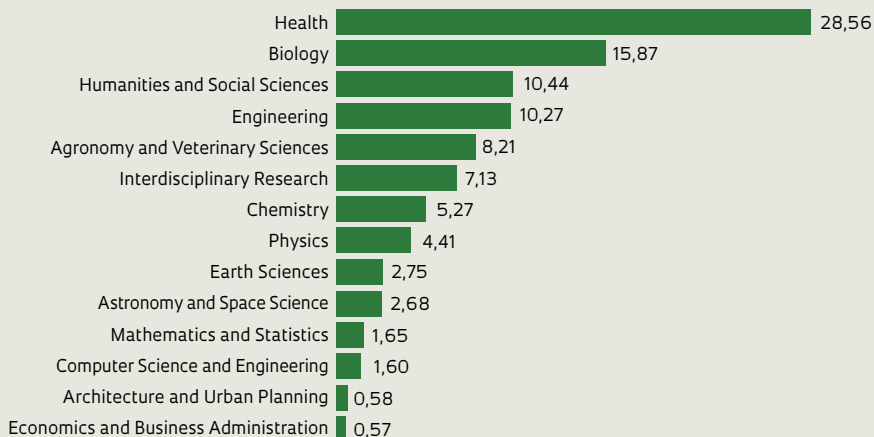
SUPPORT FOR THE ADVANCEMENT OF KNOWLEDGE

Regular Fellowships in Brazil: Undergraduate, Master's, Doctorate, Fast-Track Doctorate and Post-Doctorate; Research Internships Abroad: Fellowships for Research Internships Abroad (BEPE); Regular Grants; Thematic Grants, subdivided as follows: Regular Research Grants, Thematic Projects – Pronex, and National Institutes of Science and Technology (INCTs) Thematic Projects, the latter two under agreements signed by the Ministry of Science, Technology and Innovation (MCTI); Young Investigators Awards; São Paulo Excellence Chairs (SPEC); Human Resources Training for Research (Technical Training)

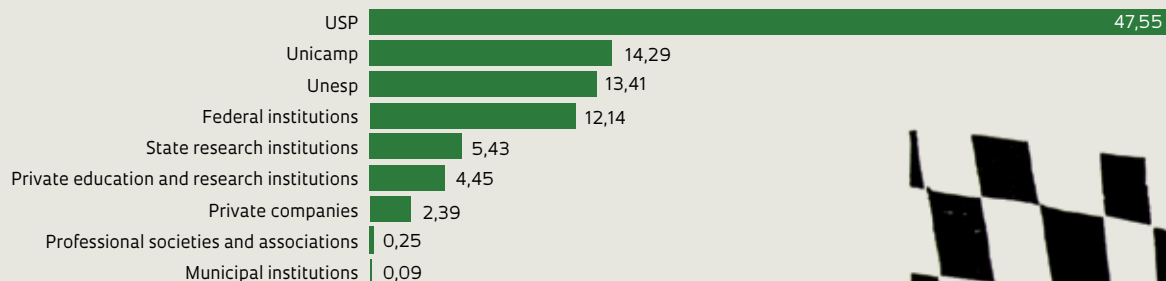
SUPPORT TO RESEARCH INFRASTRUCTURE

Support to Research Infrastructure; ANSP Network (Academic Network at São Paulo); Multi-User Equipment Program (EMU); Support for Research Book Acquisition (FAPlivros); Technical Reserve for Institutional Research Infrastructure; Technical Reserve for Connectivity to the ANSP Network; Technical Reserve for Program Coordination

FUNDS DISBURSED IN 2014 By field of knowledge (%)



According to researcher institutional affiliation (%)





ditures include the establishment of Fellowships for Research Internships Abroad (BEPE), a program aimed at undergraduate, master's and doctoral students along with post-doc researchers from São Paulo that promotes the internationalization of research by increasing outlays for fellowships abroad from less than 1% of the total to nearly 7%. Support to research infrastructure through the Technical Reserve for Institutional Research Infrastructure, a funding mechanism used, among other things, to refurbish laboratories, purchase equipment and organize technical courses to train individuals, has stood at 4% of total outlays. "In both cases, we are trying to make institutional changes in the São Paulo research system, on the one hand by promoting international experience and connections and on the other, through institutional planning," said Brito Cruz.

Projects submitted by researchers at the University of São Paulo (USP), the institution responsible for just over one-fifth of all Brazilian scientific production, received 47.55% of FAPESP disbursements in 2014. The University of Campinas (Unicamp) received 14.29% and São Paulo State University (Unesp) received 13.41%. Projects carried out at federal institutions of higher education and research in São Paulo, such as the Federal University of São Paulo (Unifesp) and the National Institute for Space Research, received 12.14% of the total outlays. Health sciences research, which has a large number of researchers and generates many fellowship and grant requests, received the highest proportion of total funding, equivalent to 28.56% (see table) followed by the biological sciences (15.8%), humanities and social sciences (10.4%), engineering (10.27%) and agronomy and veterinary sciences (8.2%).

GIANT MAGELLAN TELESCOPE

A highlight of 2014 was the increase in investments in astronomy and space science. The volume of funds disbursed in 2014 reached R\$30.9 million, compared with R\$7.9 million in 2013. This increased investment is best explained by the fact that FAPESP joined the international consortium responsible for the Giant Magellan Telescope (GMT), whose construction began in 2015 in

FUNDS DISBURSED

By funding line and selected programs – 2014

	R\$ 1000	%
Regular Fellowships	482.490	41,84
Fellowships in Brazil	403.781	35,02
Fellowships abroad	78.709	6,82
Regular Grants	423.962	36,77
Regular line of research award	303.003	26,28
Thematic projects	120.958	10,49
Special Programs	129.064	11,19
Programs to support research infrastructure	78.070	6,77
Young Investigators Awards	38.992	3,38
Other	12.002	1,04
Research for Technological Innovation Programs	117.571	10,2
Research, Innovation and Dissemination Centers	53.733	4,66
Innovative Research in Small Businesses	26.061	2,26
Other	37.776	3,24

the Chilean Andes. The GMT, which should be fully operational in 2021, will become the largest ground-based telescope in operation, promising to increase the research capacity of São Paulo's astronomy community. "Investments in astronomy, especially in cutting-edge technology, are generally long-term and strategic in nature," says astrophysicist João Steiner of USP's Institute of Astronomy, Geophysics and Atmospheric Sciences, creator and coordinator of the project that set the stage for the GMT. "The decisions made today will have a profound impact on the next generation of São Paulo scientists. That is what we are investing in." FAPESP will invest US\$40 million, which is approximately 4% of the project's total estimated cost. This investment will also ensure that São Paulo astrophysicists will be entitled to use 4% of the GMT's operating time. That community represents one-third of all Brazil's scientists and accounts for one-half of Brazil's scientific output (see *Pesquisa FAPESP* Issue no. 231).

The report shows the nature of the research investment made by the Foundation through the use of a variety of resources. When analyzed by funding objectives, 40.82% of funds targeted the advancement of knowledge whereas 51.77% went to support application-driven research and 7.4% went to the

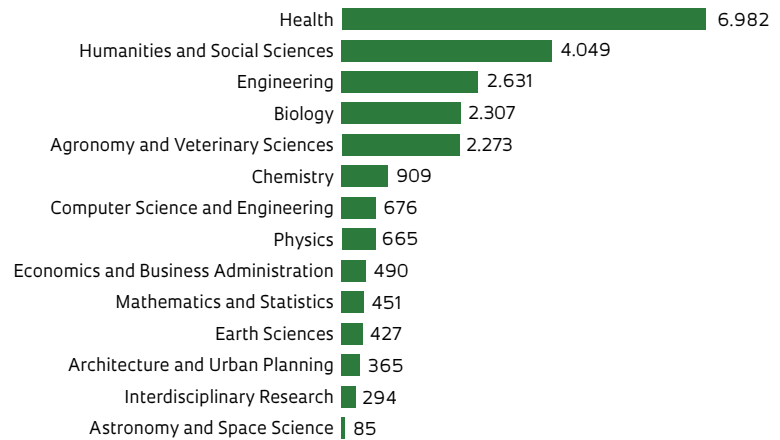
FELLOWSHIPS

Number of applications and awards of fellowships in Brazil and abroad – 2014

	Applications	Awards
Fellowships in Brazil	10.370	5.127
Undergraduate	3.282	2.143
Master's	2.735	1.006
Doctorate	2.337	1.027
Fast-Track Doctorate	189	113
Postdoc	1.827	838
Fellowships abroad	1.464	1.237
Postdoc	342	253
BEPE	1.122	984
Total	11.834	6.364

PEER REVIEW

Number of reports by field of study – 2014



improvement of the research infrastructure available in the state of São Paulo (see table). The category whose objective is the advancement of knowledge includes projects that target the training of human resources and the promotion of academic research through a significant proportion of the fellowships, regular grants and thematic projects. Additional programs such as the Young Investigators Awards and the São Paulo Excellence Chairs (SPEC) aim to establish cooperation between institutions from the state of São Paulo and highly qualified researchers abroad. The category of grants and fellowships for application-driven research targets studies that clearly have the potential for application in socially and economically important areas, such as engineering, health, agronomy and veterinary sciences as well as programs such as Innovative Research in Small Business (PIPE) and Public Policy Research. A third objective, that of funding infrastructure, seeks, among other things, to refurbish and modernize university and research institute laboratories or to update libraries and archives, which indirectly results in the advancement of science.

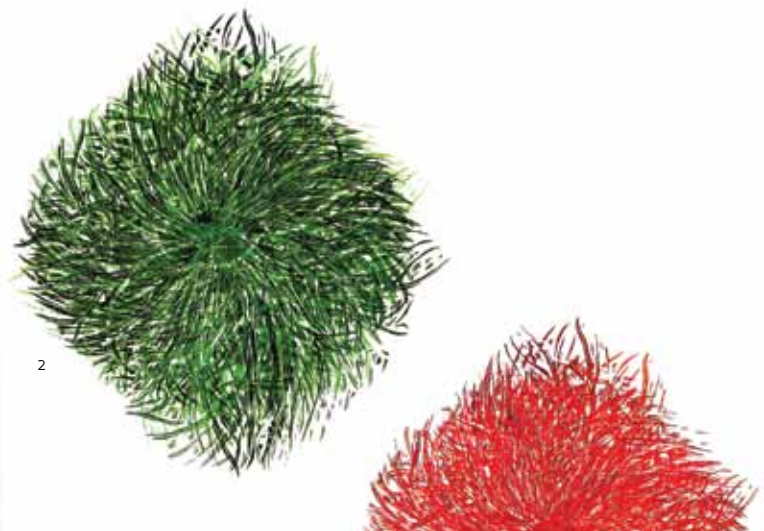
Another way to visualize FAPESP's investments is to distinguish them by funding lines, which can be grouped


into three categories. The main category, receiving 78.61% of funds, is that of research grants, which responds to the spontaneous demands of researchers. It includes a variety of fellowship mechanisms, with investments at R\$482.49 million, or 41.84% of the total, and regular grants and research projects at R\$423.96 million, or 36.77% of the total. In 2014, the Foundation paid out, on average, R\$11,197.4 in fellowships funds every month that were divided among fast-track doctorate (4,068), undergraduate (2,430), post-doctorate (1,937), master's (1,910), technical training (697), Young Investigators (79.5), Innovative Research in Small Business (46.5), public education (20.5) and science journalism (7).

SPECIAL PROGRAMS

Also contracted in 2014 were 3,949 regular research grants. The number is slightly higher than in 2013 (3,844) but less than 2012 (4,292). Grants are divided among regular research project grants (1,544), participation in scientific or technological meetings abroad (963), organization of scientific or technological meetings (560), publications (346), visiting researchers from abroad (241), participation in scientific or technological meetings in Brazil (200), thematic projects (76) and visiting researchers from Brazil (19).

A second category refers to special programs, which received 11.19% of total outlays, or R\$129.06 million in 2014. These programs seek to promote research in vital areas and to bridge gaps in São Paulo State's





science and technology system and include several programs, such as Support to Research Infrastructure and Research in eScience. The third category consists of research for technological innovation programs such as the Biota-FAPESP program that studies biodiversity, the Bioenergy Research Program (BIOEN), the Research Program on Global Climate Change (RPGCC), and Research, Innovation and Dissemination Centers (RIDC).

The report also presents data that depict the operation of the system evaluating the merits of the applications for fellowships and grants based on peer-review. Each funding request is examined by one or more researchers without formal ties to the Foundation but closely associated with the field of knowledge of the project under review.

These advisors prepare reports about the quality of the projects that serve as additional information to support the decisions made by the Foundation. In 2014, FAPESP received support from 7,566 advisors who issued 22,604 reports. Most of them (7,460 or 98.6% of the total) issued one to four reports, whereas 25 analyzed five or more projects. Most of the advisors are based in the state of São Paulo (19,524), but there are some contributions by researchers from the states of Rio de Janeiro (538 consultants), Minas Gerais (376) and Rio Grande do Sul (262), among others.

As a result of FAPESP's internationalization efforts in recent years, the proportion of postdoctoral fellowships extended to researchers from other countries has increased significantly. In 2014, foreign researchers accounted for 17% of these fellowships, led by researchers in the physical sciences, earth sciences, biology and the humanities. "This outcome is highly positive, as the presence of researchers and students of other nationalities in São Paulo necessarily fuels international collaboration in research projects and publications, thus raising the visibility and impact of the science conducted in this state," said Celso Lafer. In 2014, the number of new research internships abroad totaled 984, providing undergraduate and graduate students and postdoctoral fellows from FAPESP the



The proportion of postdoctoral fellowships offered to researchers from other countries has increased

opportunity to train in leading research centers around the world. The United States, France, England, Spain and Canada were the most frequent destinations.

Another outcome of the internationalization effort in 2014 was the signing of 38 new cooperation agreements with foreign research funding agencies and institutions of higher education and research. Another 87 agreements signed with 78 institutions from 18 countries were already in force. In 2014, FAPESP maintained the series of symposia known as FAPESP Week, which has been sponsored since 2011 for the purpose of increasing the dissemination of Brazilian science abroad and promoting cooperation with foreign research groups. For the first time, China and Germany hosted the events, which were also held on the campuses of the University of California at Berkeley and Davis in the United States. A seminar also took place in Washington, DC, organized jointly by FAPESP and the U.S. Department of Energy to discuss collaborative research on the Amazon. ■