

2014 | PROGRESS REPORT



frontiers

Open science
inspired
by community

frontiersin.org



Frontiers thanks its 50'000+ editorial board members. Here we introduce a selection of Chief Editors from our 380 academic disciplines.

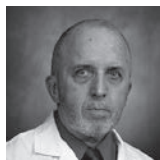
(Continued on back cover)



Mary M Christopher
University of California, USA



David B Allison
University of Alabama at Birmingham, USA



Jose Biller
Loyola University Medical Center, USA



Idan Segev
The Hebrew University of Jerusalem, Israel



Larry Abbott
Columbia University, USA



Richard A Jorgensen
University of Arizona, USA



Frederic Kaplan
EPFL, Switzerland



Martin G Klotz
University of North Carolina at Charlotte, USA



Jon H Kaas
Vanderbilt University, USA



Johannes le Coutre
Nestle Research Center, Switzerland



Derek LeRoith
Mt Sinai School of Medicine, USA



Joav Merrick
Ministry of Social Affairs, Israel



Annalisa Pastore
King's College London, UK



Henry Markram
EPFL, Switzerland



Matthias Barton
University of Zurich, Switzerland



Ferdinand Köckerling
Vivantes Hospital Berlin, Germany



Antonio Francesco Corno
University Sains Malaysia, Malaysia



Steve Suib
The University of Connecticut, USA



Alex Hansen
NTNU, Norway



George E Billman
The Ohio State University, USA



Berend Smit
University of California, USA



Mark A Elgar
University of Melbourne, Australia



Jos Van Der Meer
Radboud University Nijmegen Medical Centre, Netherlands



Jeff M P Holly
University of Bristol, UK



Carlos M. Duarte
King Abdullah University, Saudi Arabia



Kendall A Smith
Weill Medical College of Cornell University, USA



Lee Samuel Finn
The Pennsylvania State University, USA



Mel Slater
ICREA-University of Barcelona, Spain



Giuseppe Giaccone
Georgetown University, USA



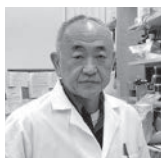
Axel Cleeremans
Université Libre de Bruxelles, Belgium



Théophile Godfraind
UCL, Belgium



Alex M Thomson
University of London, UK



Yung-Chi Cheng
Yale University, USA



Thimios Mitsiadis
University of Zurich, Switzerland



Misha Tsoydyks
Weizmann Institute of Science, Israel



Alex David Rogers
University of Oxford, UK



Nassima Ait-Daoud Tiouririne
University of Virginia, USA



Wulf Rössler
University of Zurich, Switzerland



Yousef Abu Kwaik
University of Louisville, USA



Guilherme J M Rosa
University of Wisconsin, USA



Dov Greenbaum
Yale University, USA



George Joseph Christ
University of Virginia, USA



Jennifer Wilcox
Stanford University, USA



Russell A Poldrack
Stanford University, USA



Hazim Bashir Awbi
University of Reading, UK



Gerard Apodaca
University of Pittsburgh, USA



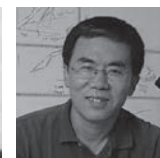
Oreste Acuto
University of Oxford, UK



Jean-Gabriel Ganascia
University Pierre and Marie Curie, France



Giulia De Lorenzo
Sapienza, Università di Roma, Italy



Cunming Duan
University of Michigan, USA



Martin Beniston
University of Geneva, Switzerland



John Steven Torday
University of California, USA



Annette Cameron Broderick
University of Exeter, UK



Kenneth I Berns
University of Florida, USA



Robert Kenneth Semple
University of Cambridge, UK



Neelima Roy Sinha
University of California, USA



Forrest Masters
University of Florida, USA



Atsushi Asakura
University of Minnesota, USA



Jonathan H Tobias
University of Bristol, UK



Jean-Baptiste Poline
UC Berkeley, USA



Stefan Borgwardt
University of Basel, Switzerland



Daniel Gaudet
Université de Montréal, Canada



Robert J Harvey
UCL School of Pharmacy, UK



Stephen Silberstein
Thomas Jefferson University, USA



Raimond L Winslow
The Johns Hopkins University, USA



Jaime Kapitulnik
The Hebrew University of Jerusalem, Israel



Hermann Wagner
Technische Universität München, Germany



Robert T Knight
UC Berkeley, USA



Nick Duffield
Texas A&M University, USA



Alois C Knol
Technische Universität München, Germany



Dietrich R T Zahn
Technische Universität Chemnitz, Germany



Lera Boroditsky
Stanford University, USA



William Tupper Couldwell
University of Utah, USA



Frank J.M. Verstraete
UC Berkeley, USA



Greg W Rouse
Scripps Institution of Oceanography, UCSD, USA



Bernhard Hommel
Leiden University, Netherlands



Michael Rychlik
Technische Universität München, Germany



Philippe C. Baveye
Rensselaer
Polytechnic
Institute, USA



Nina Bhardwaj
New York
University School
of Medicine, USA



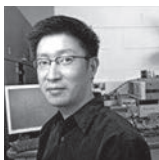
Louis R Caplan
Harvard Medical
School, USA



Crystal Mackall
National Cancer
Institute, USA



Peter H Seeburg
Max Planck
Institute for Medical
Research, Germany



Nicholas X Fang
MIT, USA



David Erlinge
Lund University,
Sweden



Jorge Asconape
Loyola University,
USA



Ian B. Wilkinson
University of
Cambridge, UK



Gerard Apodaca
University of
Pittsburgh, USA



Izuru Takewaki
Kyoto University,
Japan



**Prosun
Bhattacharya**
Royal Institute of
Technology, Sweden



Peter A. Stokes
King's College
London, UK



**Luigi Daniele
Notarangelo**
Harvard Medical
School, USA



Yenan Bryceson
Karolinska
Institutet, Sweden



Takao K. Hensch
Harvard University,
USA



Michael Thompson
National Center
for Atmospheric
Research, USA



Jumana Y Al-Aama
King Abdul Aziz
University,
Saudi Arabia



Maria J Donoghue
Georgetown
University, USA



**Timothy Ian
Eglinton**
ETH Zürich,
Switzerland



Roger Deal
Emory University,
USA



Steven L. Forman
Baylor University,
USA



Sidney A Simon
Duke University,
USA



William J Brown
Cornell University,
USA



Silke R. Sperling
Charité University
Hospital, Germany



**Ah-Hyung Alissa
Park**
Columbia
University, USA



Christian Barillot
CNRS, France



Natasha Kirkham
Cornell University,
USA



Mary B Kennedy
Caltech, USA



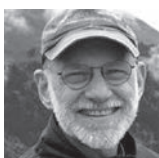
Javier DeFelipe
Cajal Institute,
Spain



**Christine Anne
Biron**
Brown University,
USA



Peter Convey
British Antarctic
Survey, UK



Richard Ferber
Boston Children's
Hospital



Harold W Goforth
Duke University,
USA



Juergen Brugger
EPFL, Switzerland



Valerio Acocella
Università Roma
Tre, Italy



Rustam Aminov
Technical
University of
Denmark, Denmark



Paola Patrignani
"G. d'Annunzio"
University, Italy



Philipp Kaldis
A*STAR, Singapore



**Kanwaljeet J. S.
Anand**
University of
Tennessee, USA



Morten Overgaard
Aarhus University,
Denmark



Ruben Coronel
Academic Medical
Center, Amsterdam,
Netherlands



John J Foxe
Albert Einstein
College of
Medicine, USA



Paul D Losty
University of
Liverpool, UK



Govind K Makharia
All India Institute of
Medical Sciences,
India



Farhad Islami
American Cancer
Society, USA



Angel Borja
AZTI-Tecnalia,
Spain



Geoffrey A Head
Baker IDI Heart and
Diabetes Institute,
Australia



Manuel Carreiras
Basque Center on
Cognition, Brain and
Language, Spain



Gil Bernard Garnier
Bioprocessing
Research Institute of
Australia, Australia



Eddy J Davelaar
Birkbeck College,
University of
London, UK



Barry D Jordan
Burke
Rehabilitation
Hospital, USA



Alberto Albanese
Università Cattolica
del Sacro Cuore,
Italy



Bernhard Moser
Cardiff University,
UK



Richard E Boyatzis
Case Western
Reserve University,
USA



Mark A Sperling
Childrens Hospital
of Pittsburgh of
UPMC, USA



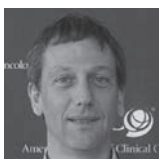
Michael L Moritz
Childrens Hospital
of Pittsburgh of
UPMC, USA



Sylvia Anton
INRA, France



**Christiani
Jayekumar Henry**
CNRC, Singapore



**Jean-Pascal
Machiels**
UCL, Belgium



Philippe Lory
CNRS & University
of Montpellier,
France



Diego Rubiales
Consejo Superior
de Investigaciones
Cientificas, Spain



John C. Mauro
Corning
Incorporated, USA



Emilio Elizalde
CSIC, Spain



Nick Van De Giesen
Delft University
of Technology,
Netherlands



Zsolt Molnár
University of
Szeged, Hungary



Timothy J Kinsella
Medical School of
Brown University,
USA



Ole Haagen Nielsen
University of
Copenhagen,
Denmark



Elizabeth A. Kellogg
Donald Danforth
Plant Science
Center, USA



Ulrich M Zanger
IKP Stuttgart,
Germany



Eliot Ohlstein
Drexel University
Med., USA



Jordi Figuerola
Estacion Biologica
de Doñana - CSIC,
Spain



Aaron Vinik
Eastern Virginia
Medical School,
USA



**Jean-Claude
Georges Buznli**
EPFL, Switzerland



**Jimmy Thomas
Eirde**
Brody School of
Medicine, USA



Sandro Etalle
Eindhoven
Technical University,
Netherlands



Carmen Sandi
EPFL, Switzerland



Donat P. Häder
Friedrich-Alexander
Universität Erlangen
Nürnberg, Germany



Iñigo J. Losada
University of
Cantabria, Spain



**Eric Pieter
Achterberg**
GEOMAR Kiel,
Germany



Pierre J Magistretti
EPFL, Switzerland

2014 | Milestones

January

iTHENTICATE
screening

February

REVIEW FORUM
new design
live

February

ARTICLES PAGES
new design
live

April

YOUNG MINDS
launched

June

30th
field journal
launched

August

30Kth
manuscript
submitted

September

RESEARCH TOPIC
new design
live

September

ALPSP INNOVATION IN PUBLISHING
Gold award

October

50Kth
scientific
editor

October

300th
eBook
published

November



new logo
& branding

November



in beta with
Nature.com

November

8M
monthly
page views

November

ARTICLE IMPACT PAGES
new

December

17
Journal
impact
factors

December

180K
registered
users



Kamila Markram, CEO, Frontiers

In 2014, Frontiers once again enjoyed a year of excellent growth. More Frontiers journals have become leaders in their category, as highlighted in the graphic on page 11; we published more than 11'000 articles over 34 fields; we now have over 50'000 editors signed up onto our editorial boards; our team has expanded to over 150 people, including a presence in San Francisco as of 2015.

In 2014, we expanded our "Frontiers in" field journal series by 12 titles, representing in all over 100 new specialty sections. We now have comprehensive coverage of the scientific, medical and technical domains; with the launch of "Frontiers in Digital Humanities," we bring our open-access proposition to new communities in humanities and social science for the first time.

Our IT team of 70 people has been working in overdrive to bring a series of improved products and services to your community. We opened a new on-line interactive review forum that does an even better job at putting our principles of collaborative peer review into action. The Frontiers Research Topic

has a new project environment that highlights the scientists alongside the publications. We developed new ways to display impact metrics, one of our key services ever since we invented online article metrics in 2008. The Frontiers Research Network has become Loop, the first platform for networking and profiles that plugs into all third-party web environments of publishers and universities. And Frontiers enjoyed a hugely successful launch of its outreach project, Frontiers for Young Minds.

These major developments and upgrades are all part of the reason that Frontiers was the 2014 laureate of the ALPSP *Innovation in Publishing* Gold Award.

I am proud of the work our team has accomplished this year – those listed above are just a selection of achievements described in this report. And yet, in many ways, much of the effort of 2014 still waits to fully unfold as we prepare Frontiers for the next level of its development. So keep your Loop profile open to follow the next wave of Frontiers product releases in 2015.

NUMBERS (as of January 2015)



Seven years of leading innovation



Frontiers is launched as a grassroots initiative by **Kamila Markram** and **Henry Markram**, two neuroscientists from the Swiss Federal Institute of Technology in Lausanne, Switzerland, together with a group of neuroscientists, out of the collective desire to empower researchers in taking responsibility for scholarly publishing, democratize the entire process and provide better online tools and services to researchers in the Internet age.

2007

2008

2009

2010

2011



Ten new open-access journals open for submission.

Online profiles are introduced for authors, editors and researchers. Profiles are integrated into the article pages and across the entire Frontiers journal system, making authors, reviewers and editors visible.

Second generation Collaborative Review Forum released allowing easier interaction between authors and reviewers.

First open-access journal Frontiers in Neuroscience opens for article submission.

Frontiers pioneers radical innovation in web technology to **launch the Collaborative Review Forum**, which allows seamless interaction between authors and reviewers during the peer-review process.

Frontiers is the **first publisher to launch article level metrics** and journal level metrics to measure research discoveries in a quantitative and objective way.



Frontiers becomes the first publisher to launch **author and profile impact metrics**.



2012

1



One new open-access journal open for submission.

The **Frontiers Research Network** is launched, the first network to be fully integrated into an open-access publishing platform, the Frontiers journal series.

2013

9



Nine new open-access journals open for submission.

Frontiers becomes one of the **five largest open-access publishers**.

Frontiers for Young Minds is launched, an open-access scientific journal written for – and reviewed by – young people.

Frontiers pilots and launches the third version of its **Collaborative Review Forum**, a radical innovation in reviewing and publishing technology.

2014

12



Twelve new open-access journals open for submission.

Frontiers portfolio now includes **51 journals** spanning **34 academic fields** and over **380 research specialty sections**.

Frontiers receives the **ALPSP Gold Award For Innovation in Publishing**.

2015



The Frontiers Research Network evolves and **Loop is launched**, linking researcher profiles to articles published not only at Frontiers but also across independent websites, including **nature.com**.

Frontiers expands its presence in **humanities and social sciences** with several new titles.

More exciting changes ahead.

Marketing and communications

FRONTIERS IN THE NEWS

In 2014, 80 articles were promoted and received press coverage in over 500 reported news items, which represents a 100% increase over 2013.

.....

WIRED

Optogenetics used to stop rats binge drinking

"A team of neurobiologists taught rats to binge on alcohol, then watched as each refused a drink when their dopamine-controlling neurons were stimulated."

.....

BBC

Mathematics: Why the brain sees maths as beauty

"Brain scans show a complex string of numbers and letters in mathematical formulae can evoke the same sense of beauty as artistic masterpieces..."

.....

NewScientist

Learning drugs reawaken grown-up brains's inner child

"A drug for perfect pitch is just the start: mastering new skills could become easy if we can restore the brain's youthful ability to create new circuits."

.....

Virtual arm eases phantom limb pain

"Doctors have devised a new way to treat amputees with phantom limb pain."

.....

theguardian

Man develops powerful love of Johnny Cash following deep brain stimulation

"Brain implants have had the unexpected and intriguing side effect..."

The New York Times

How a Lizard Gets Rid of a Suitor

"Female dragon lizards in Australia develop orange patches on their underbellies when they are fertile; the patches disappear only after they lay their eggs."

Can Exercise Reduce Alzheimer's Risk?

"Exercise may help to keep the brain robust in people who have an increased risk of developing Alzheimer's disease..."

INSTITUTIONAL AGREEMENTS

Fourteen new institutions signed up for membership / invoicing agreements, which represents an increase of 250% over 2013 and brings the total now to 25. This success underscores the growing acceptance of the

open-access publishing movement on the institutional level and represents the first stages of an evolution towards a billing system that will be transparent for authors and easy for university administrators.

ALPSP AWARD



*"The judges **awarded Gold to Frontiers**, the open science platform. This innovative peer-review platform brings authors and reviewers together in discussions which in turn leads to better content, speedier review process and increased transparency."*

NEW LOGO AND BRANDING

With the celebration of our **seventh birthday** in November, we rethought the corporate branding of our editorial programs, bringing into focus our main innovations of peer review, impact metrics, research networking and outreach to the general public. For this we selected a graphical



concept based on a fresh and dynamic color scheme extended across a variety of shapes and abstract geometries. The boldness of the concept, rolled out across the corporate message and with individual new concepts for each product, has enjoyed an enthusiastic reception from our entire community.

Building bridges to academic communities

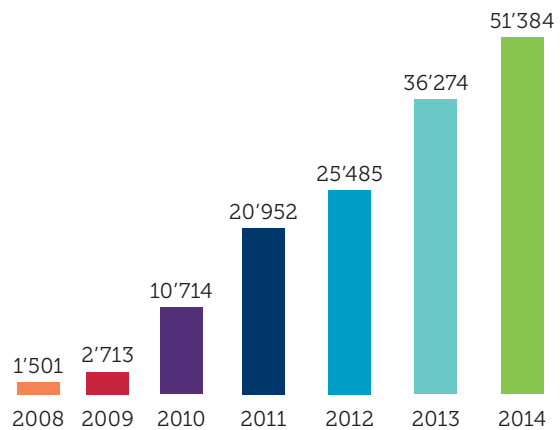
At Frontiers, the community remains at the center of our focus. In order to ensure the highest standards for our journals, we carefully vet each candidate proposed as Specialty Chief Editor, because the Specialty Section is the basic building block of our editorial structure.

In 2014 alone, we brought 15'000 additional editors onto our editorial boards, as the teams for 12 new Field Journals fell into place.

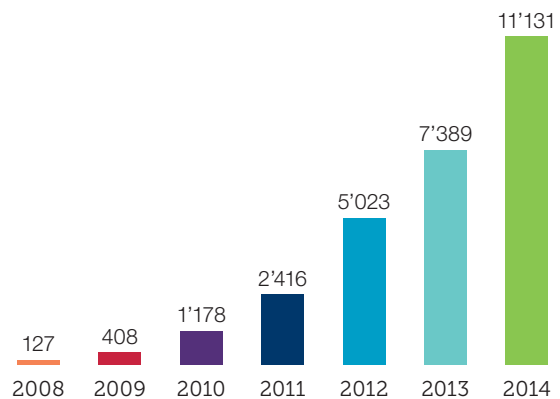
We design our journals to take into account the multidisciplinary nature of science, facilitating synergies across research areas and improving discoverability through the cross-listing of Specialty Sections in two or more Field Journals. The result is that the 34 Field Journals at Frontiers are actually woven together via these cross-listed sections, resulting in a coherent, unified editorial structure. And on the finest scale, we offer the Frontiers Research Topic, which publishes the work of even the smallest of niche communities in a way that brings effective promotion to the circle of researchers involved.

Our goal remains to provide an adequate publication channel for the work of researchers of all fields of study no matter how big or small the research area.

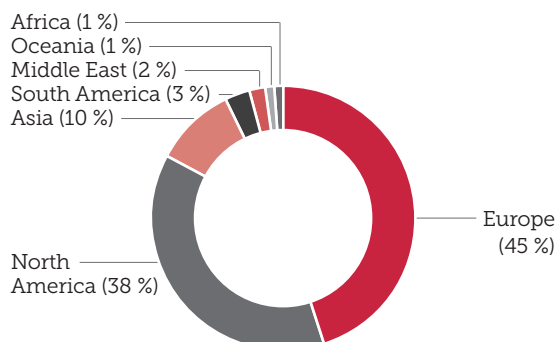
EDITORS



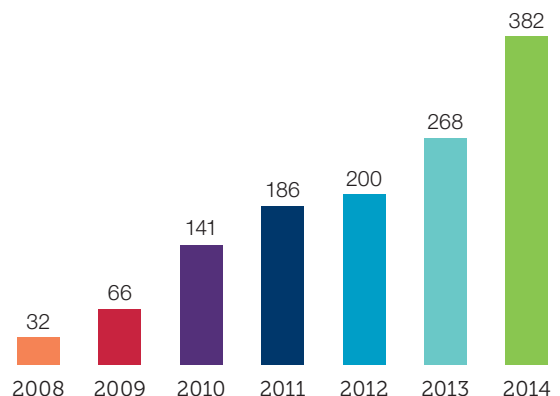
ARTICLES PUBLISHED



EDITORS BY CONTINENT



SPECIALTIES



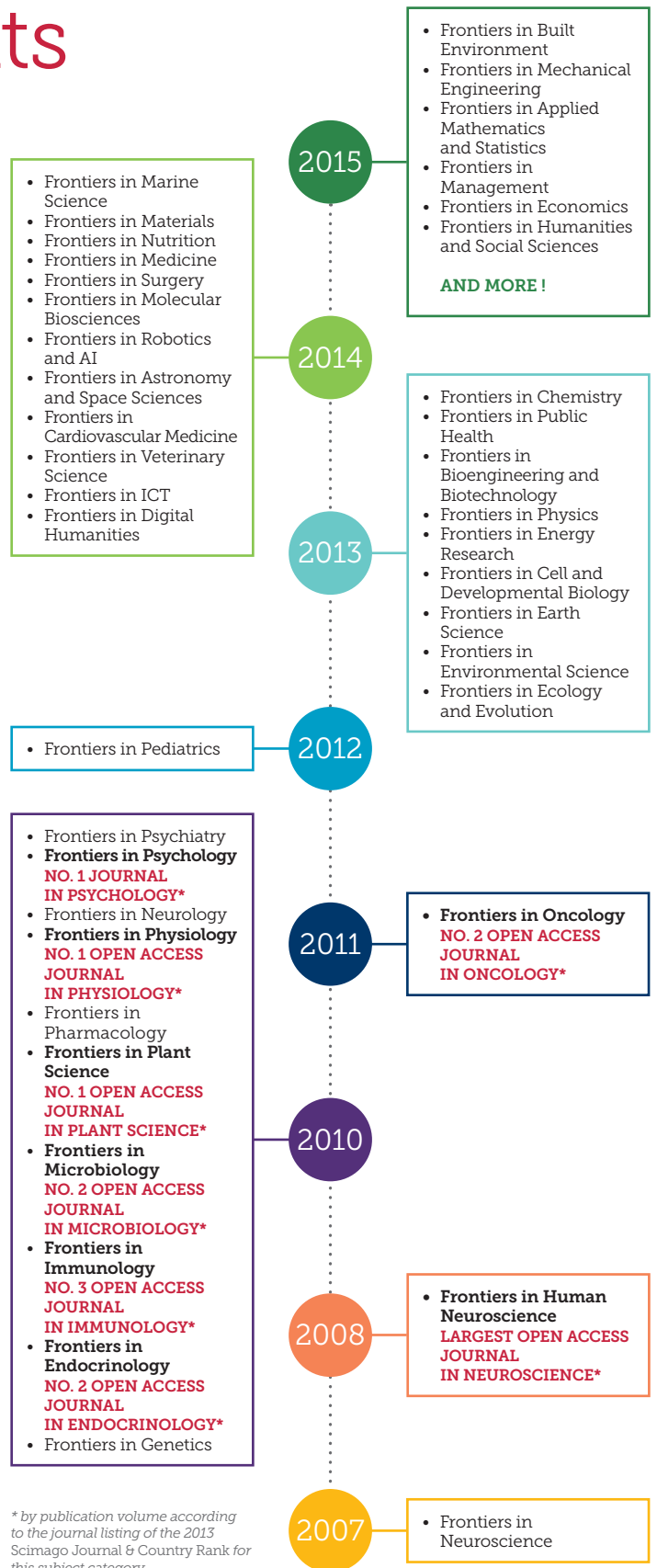
Field journals rise to new heights

Frontiers significantly increased its catalogue of titles in 2014, with a focus on the medical fields. New journals included Frontiers in Surgery, Frontiers in Medicine and Frontiers in Cardiovascular Medicine. To complement the portfolio of human health, Frontiers in Veterinary Science was also established – in all, 12 new journals were launched with a total of 6'600 editors worldwide supporting these initiatives.

Frontiers now covers 34 academic fields with 382 speciality sections. The second wave of Frontiers titles launched after 2012 has gained excellent traction with 490% growth in these fields. In 2014 Frontiers has taken exciting first steps moving into the fields of Humanities and Social Sciences with the launch of Frontiers in Digital Humanities. We now have 17 journals indexed in the Web of Science, translating into over 70% of Frontiers content discoverable in this database.

IMPACT FACTORS

- Frontiers in Human Neuroscience: **2.9**
- Frontiers in Cellular Neuroscience: **4.2**
- Frontiers in Computational Neuroscience: **2.2**
- Frontiers in Neural Circuits: **3.0**
- Frontiers in Neuroanatomy: **4.2**
- Frontiers in Aging Neuroscience: **2.8**
- Frontiers in Behavioral Neuroscience: **4.2**
- Frontiers in Cellular and Infection Microbiology: **2.6**
- Frontiers in Microbiology: **3.9**
- Frontiers in Plant Science: **3.6**
- Frontiers in Psychology: **2.8**
- Frontiers in Molecular Neuroscience: **JULY 2015**
- Frontiers in Neuroinformatics: **JULY 2015**
- Frontiers in Neuroscience: **JULY 2015**
- Frontiers in Pharmacology: **JULY 2015**
- Frontiers in Physiology: **JULY 2015**
- Frontiers in Neurorobotics: **JULY 2015**



Research Topics: publishing tuned to communities

The Frontiers Research Topic is a collection of articles published around a theme of cutting-edge research. With over 2'500 topics posted to date, the Research Topic is a platform proven to unite the world's experts around a topic, to stimulate dialogue and collaboration, and to accelerate science.

In 2014, we redesigned the Research Topic project pages in a way that optimizes the reach and impact of both the articles and the people behind the research. This includes a new environment to highlight the role of Topic Editors, with links directly to their Loop profiles; powerful new impact metrics displayed on the project page; a revamped discussion forum; and the possibility to

download the full Research Topic as an e-book.

Very much like a "mini journal," the Research Topic provides even the most specialized areas of the scientific community with a publishing environment suited to its needs. But by putting the people behind the Research Topic front and center, the Frontiers platform also creates a social dynamic similar to that of a workshop.

Research Topics are perhaps the best example of the Frontiers mission in action: making scientists and their research optimally discoverable by providing the best tools and environments as developed from state-of-the-art web technology.

NUMBERS *(January 2015)*



2.5K

Research Topics
organized



6K

Researchers
edited a
Research Topic



70K

Contributing
authors



90K

Social media shares
of Research Topic
pages



14M

Research topic
views
of editors and
authors



32M

Views of dedicated
Research Topic
pages



35M

Views and
downloads
of Research Topic
articles

- 1 Full integration into **Loop**, our **research network** for scientists and scholars.
- 2 Freely downloadable **e-books** of the entire article collection.
- 3 **Overview section**: provides the title, scope and objectives in one place.
- 4 **Articles tab**: highlights published articles, abstract and impact summary.
- 5 **Contributors tab**: features authors and topic editors for maximum discoverability and impact.
- 6 **Discussion Forum** around this Research Topic and its articles.
- 7 **Powerful impact metrics** on the Research Topic and its articles, including views, downloads, social media buzz, geographic and demographic info.
- 8 **Online academic profiles** for editors and authors.
- 9 **Article impact metrics** including views, downloads, citations, social media shares, social buzz via Altmetric, geographic and demographic info.

Re-engineering peer review

Improving peer review has always been a priority at Frontiers. Our unique peer review is engineered to be rigorous, yet at the same time collaborative, fair, efficient and transparent. These guiding principles were initially integrated into our sophisticated online review platform, the Frontiers Collaborative Review Forum, which was released in a new, completely redesigned version in early 2014.

Based on the feedback provided by our users, we focused on improving the user experience and providing a more task-oriented and intuitive platform for authors, reviewers and editors. The new design of the interactive forum further facilitates interaction and collaboration between all participants,

to elevate the quality of manuscripts and their impact.

While maintaining our high standards of rigor, fairness and transparency, we also included a number of new features to reduce the pressure on our editors, including a full plagiarism check directly at submission for all manuscripts and the ability to contact reviewers with all the relevant information in the simple click of a mouse.

With 3'500 manuscripts currently under review, the response from the community has been overwhelmingly positive. As we move forward, we will focus on additional improvements to our guidelines and policies to make sure that Frontiers remains a leading innovator in the scientific publishing world.

COMMUNITY FEEDBACK (January 2015)



85

days

from submission to acceptance



90%

of our authors

feel our collaborative review has helped improve their paper



90%

of our authors

rated our collaborative review forum as good or excellent



80%

of our authors

prefer our collaborative review over traditional peer review



90%

of our authors

were happy with the level of support received by Frontiers' staff during the publishing process



80%

of our reviewers

think the review questionnaires provided helped them focus on the most important aspects of the paper

1 Process bar showing precise status of review

2 Rapid access to **submitted materials**

3 **Action summary** seen at first glance

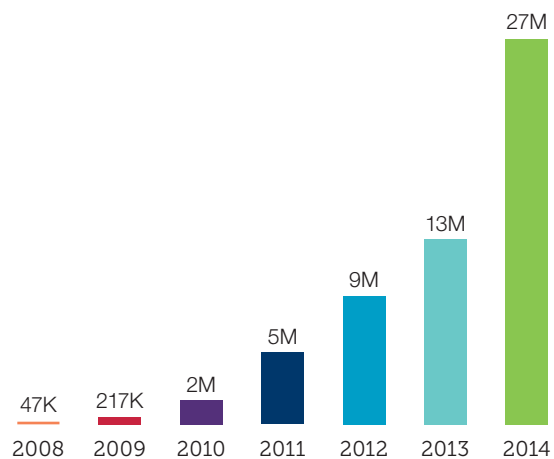
4 **Tabular organisation** of all aspects of the process, including reviewer selection and full process history

5 **Interactive forum** in which authors, editors and reviewers can communicate in real time

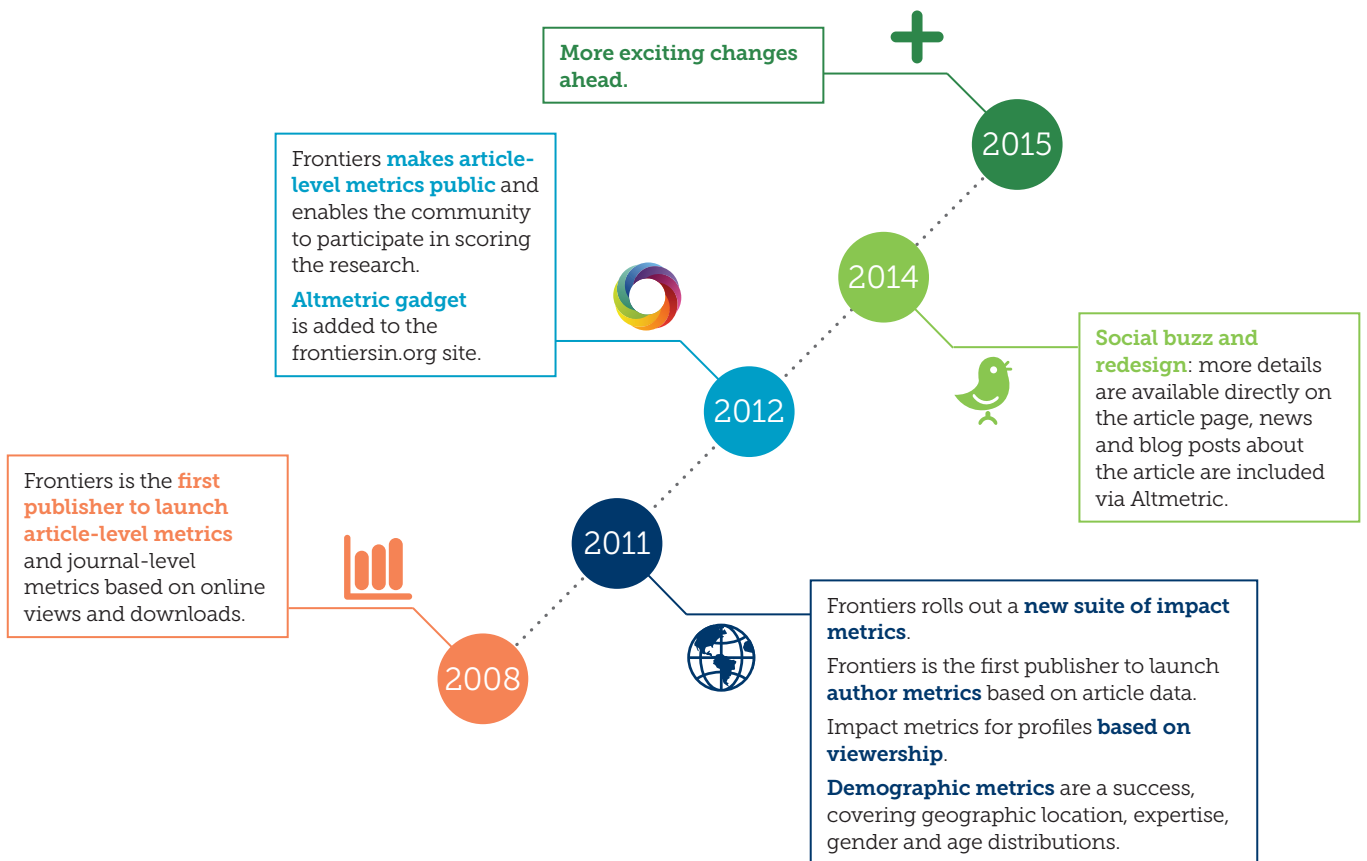
Following impact: a new suite of article metrics

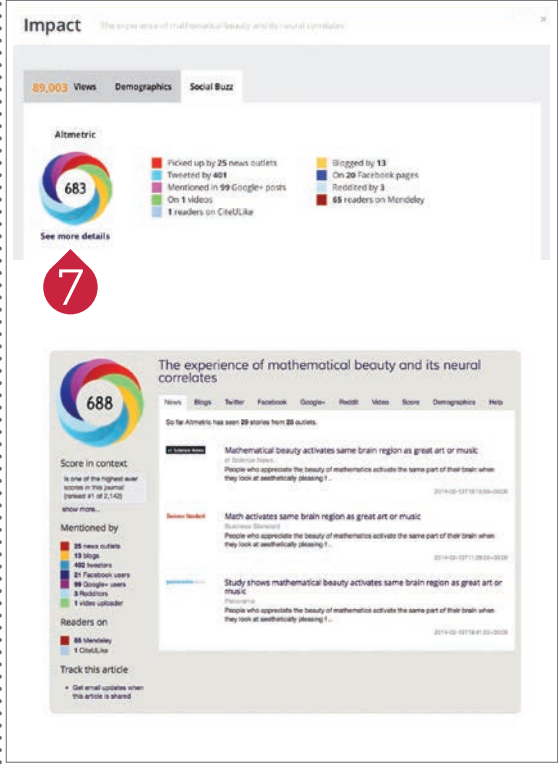
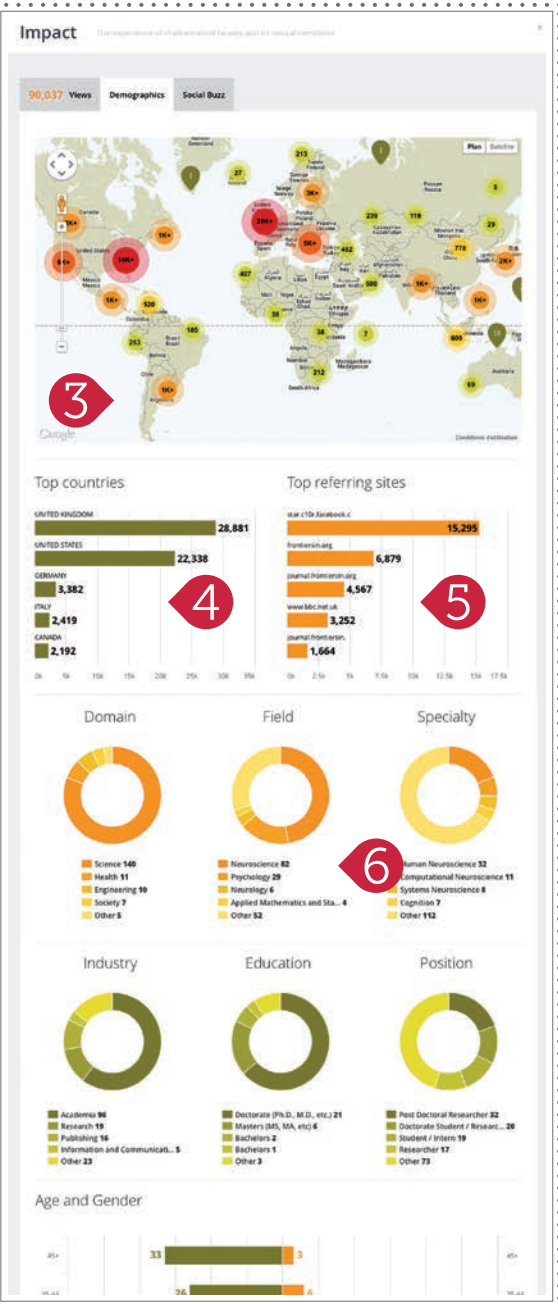
Providing impact metrics has been one of Frontiers' priorities since the beginning. The goal is to provide data in a manner that allows users to immediately and quantitatively assess the reach and growing influence of their work, and that also allows them to share this with collaborators, funders and the research community in general. Already in 2008, Frontiers launched its first article-level and journal-level metrics, and the suite of data available to researchers has regularly improved. In 2014, the impact-metrics package at Frontiers underwent a major redesign, allowing a real-time monitoring of views and downloads; social buzz; visitor demographics; and aggregated author impact.

ARTICLE VIEWS AND DOWNLOADS PER YEAR



TIMELINE





- 1 Full history of the article views and downloads
- 2 Toggle between timeline and bar-chart views
- 3 Geographic summary of international activity
- 4 Country ranking

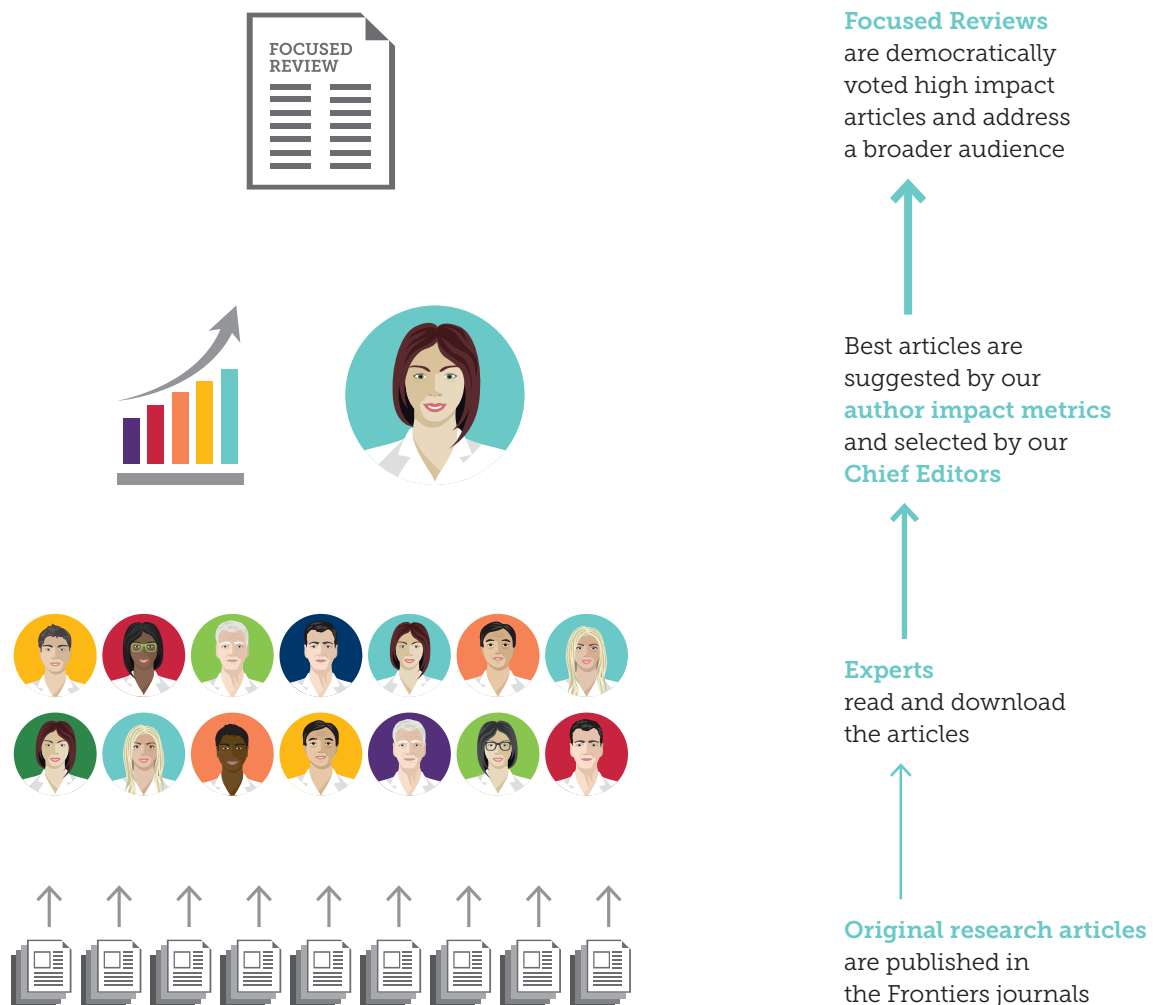
- 5 Top referring sites
- 6 Detailed demographics of the registered viewers, including area of expertise, position, age and gender
- 7 Altmetric summary, showing social networking pick-up, with a link to the detailed Altmetric analysis

Tiering – crowdsourcing the best articles

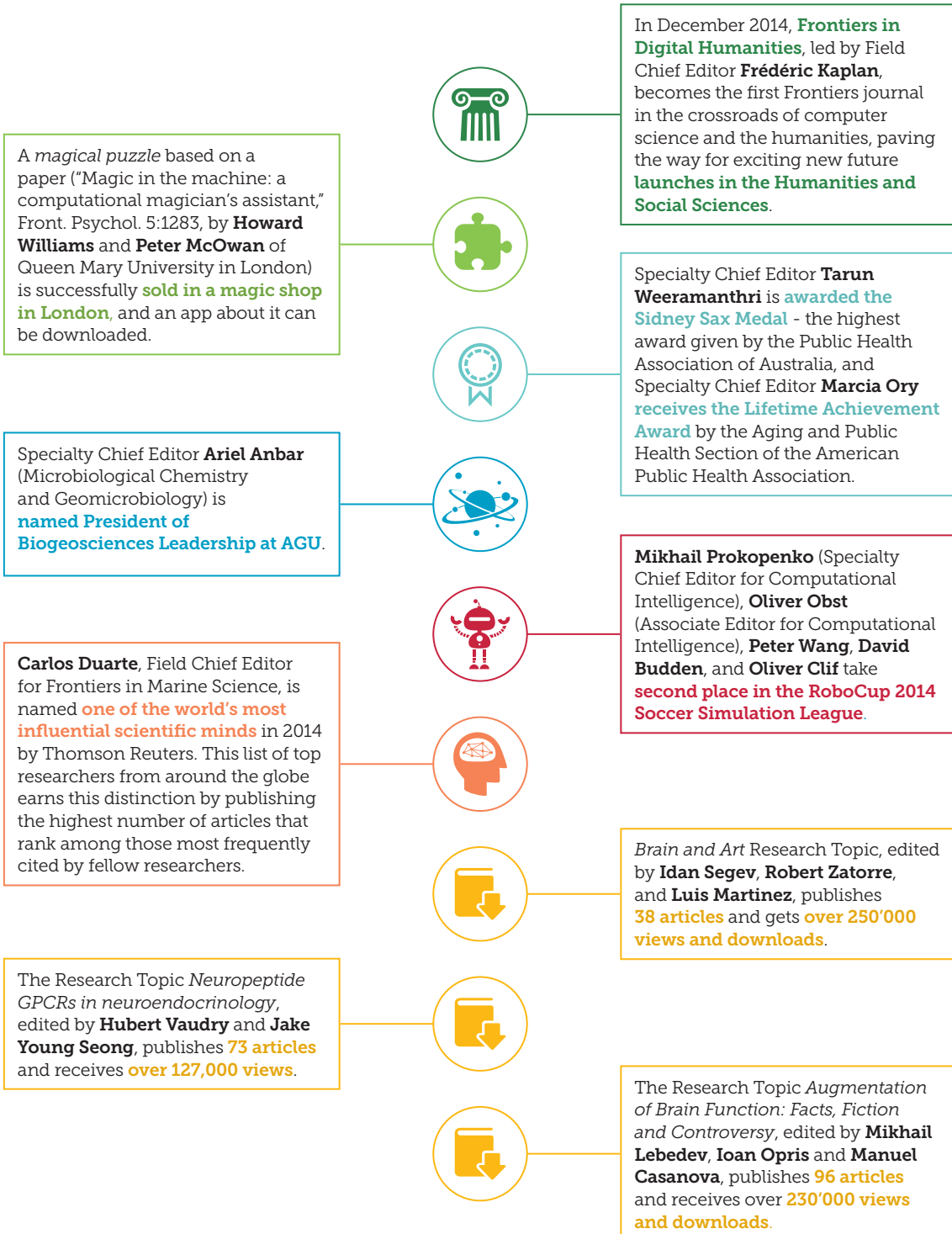
Following article publication, the impact metric data is collected, evaluated and used as a basis for our Chief Editors to invite authors of high impact articles to write the prestigious “Focused Review”, a free article type that puts the original discovery into a wider context, for a broader audience and a deeper impact. We call this process “tiering.” Frontiers is so far the only publisher to design a system that semi-automatically distills the

most outstanding research in this crowdsourced way on the basis of impact metrics, evaluated democratically for its academic excellence and social relevance. While climbing up from Original Research to Focused Review, the research addresses a broader public and becomes more socially relevant. In 2014, tiering resulted in the publication of 33 Focused Reviews and 25 Frontiers Commentaries.

HOW IT WORKS



Outstanding achievements from our community



Frontiers for Young Minds

Frontiers for Young Minds is our scientific journal for children and teens in which young people get directly involved as reviewers. The Journal has inspired kids and scientists from around the world, operates on a non-profit basis, and already offers a collection of almost 40 articles in the neurosciences.

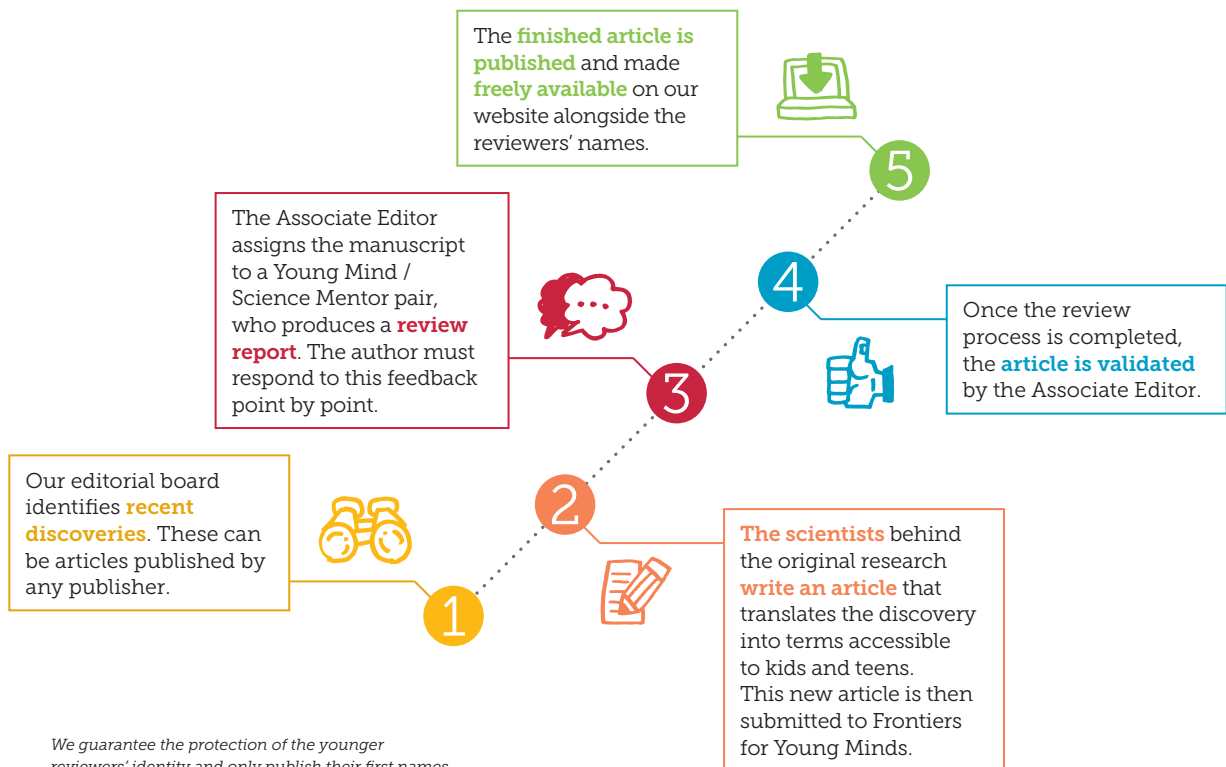
With the start of generous support from the Jacobs Foundation, our initial program has grown into a more scalable, integrated, and user-friendly system. This scalability let us branch into new disciplines, including Neuroscience, the Earth and its Resources, and Astronomy and Space Science.

Frontiers for Young Minds extends bridges to younger audiences, not only providing them with access to cutting-edge research in a form they can understand, but also involving them in a critical step of the scientific process itself.

Additional collaboration with Scientific American has introduced the journal to numerous research communities and curious young minds, with appearances at international conferences and the new weekly companion blog on the Scientific American Blog Network.

Frontiers for Young Minds was selected as one of the **2014 "Great Websites for Kids"** by the American Library Association.

HOW IT WORKS



Dad Can Do Time Travel ... But Grandpa Can't!
Think about what your brain does when you remember. As an experiment, try to remember what you had for lunch yesterday. Maybe it will come to you immediately, but chances are that you will have to think back about where you were when you were eating lunch, whom you were with, what you were talking about or thinking about, and so on. Eventually, the memory of your lunch will reappear! What you have actually done is recalled a specific event – that is, a time, place, and series of sensory experiences – that together constitute a complex memory. We refer to this type of memory as episodic memory, because it represents a specific episode or event in your life. In general, episodic memory refers to memory for events, and you recall them by performing "mental time travel"; that is, thinking back to where you were and what you were doing to recall elements of the event that allow you to retrieve the entire event.

Cognitive development
Who is the smartest in your family?
Autumn, 15 years old

So You Think You Can't Dance? (The Mysterious Case of the Guy with Two Left Feet)
Got rhythm? Most of us do – at least a little bit. Believe it or not, even babies can feel the beat of a rhythm. However, science has documented the first case of a person who could not dance to the beat. His name is Mathieu, and he is an intelligent, talented – even musical – guy with no other known brain problems, except, he cannot find the beat in music.

Scientific Significance of Sleep Talking
Did one of your parents, siblings, or friends ever tell you that you were talking in your sleep? Nothing to be ashamed of! A recent study found that more than half of all people have had the experience of speaking out loud while being asleep. This might even be underestimated, because often people do not notice that they are sleep talking, unless somebody wakes them up or tells them the next day. Most neuroscientists, linguists, and psychologists studying language are interested in our language production and language comprehension skills during the day. In this study, we will explore what is known about the production of overt speech during the night. We suggest that the study of sleep talking may be just as interesting and informative as the study of wakeful speech.

Young Minds of the USA Science and Engineering Festival
9-15 years old

Feeling Your Way and Knowing by Touch
You can perceive things by touching, tasting, smelling, listening, and seeing.
Henry, 13 years old

Meg for Kids: Listening to Your Brain with Super-Cool SQUIDS
Inside your brain, you have over 80 billion neurons – tiny brain cells, all working together to make you the person you are.

Ever wondered what playing video games does to your brain?
Children today interact with media an average of 7 hours a day, every day including weekends. That is more than the weekly time adults spend at work. What is the impact of so much media consumption? Research in this field is still in its infancy, but an emerging field on video game and the brain suggests that we are in for some surprises.

When Bed Goes Bad: How the Brain Can Fix Mistakes in Speech While They Happen
For the most part, we talk because we want to communicate with others: our friends, parents, teachers, even pets. Our voice carries our message to other people's ears. However, there are not the only

White Matter Counts: Brain Connections Help Us Do 2 + 2
The brain is made of many millions of cells, and different kinds of cells have different functions. The

NUMBERS (January 2015)

5	37	50	120	1.2K	15K	100K
Classrooms	Articles	Scientific editors	Young Minds	Twitter followers	Facebook likes	Article views

IN THE PRESS

CURRENT PARTNERS



SUPPORTED BY



Named a **GREAT WEBSITE FOR KIDS** by the American Library Association

Maximising impact for researchers:

Loop, the new Frontiers Research Network, was launched in BETA on 16 October 2014.

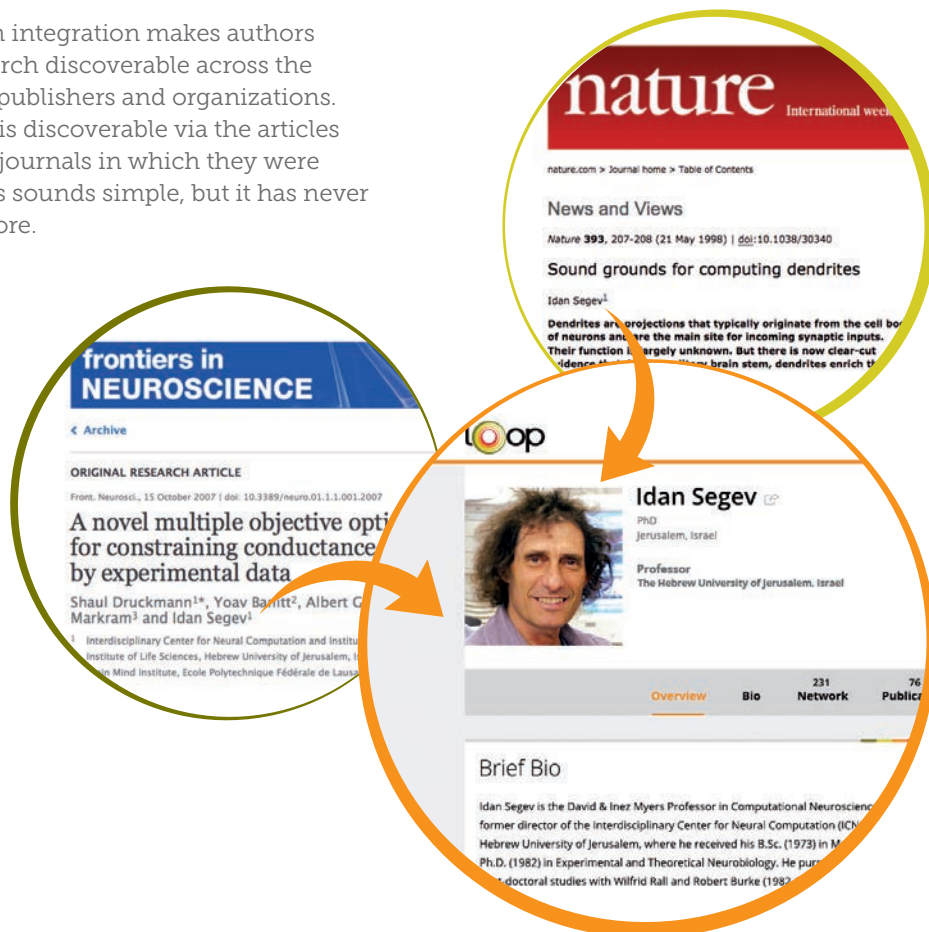
Furthering the Frontiers mission to increase readership of articles and enhance the reputation of academics within their communities and beyond, Loop is the very first open, cross-platform network for researchers. Loop profiles are available for integration into all journals and academic websites, allowing for the discoverability of researchers and their work across multiple domains. Loop BETA was released in conjunction with our first partner, Nature Publishing Group, enabling the direct linking of original articles published in the

Frontiers Journal Series and selected nature.com journals to the full profiles of the authors on Loop.

Our research network today offers a rich set of features to automatically promote academic achievements within an international community, enabling researchers to stay up-to-date with new research and connecting them to their peers. This includes detailed impact metrics and machine learning algorithms that disseminate relevant research to the people who matter. Moving forward, Loop will continue its mission and develop functionality that works on behalf of researchers to maximise the readership and impact of their work.

INTEGRATED

Cross-platform integration makes authors and their research discoverable across the boundaries of publishers and organizations. A Loop profile is discoverable via the articles in the original journals in which they were published. This sounds simple, but it has never been done before.



REPUTATION & IMPACT

Our platform disseminates work and maximizes readership. We provide feedback on readership and impact across institutions, geographies and disciplines.

Idan Segev
PhD
Jerusalem, Israel
Professor
The Hebrew University of Jerusalem, Israel

72,172 Total views
32,943 Profile views
12,608 Publication views
1,944 Publication downloads

Overview | Bio | Network (231) | Publications (76) | Topics (2)

Brief Bio
Idan Segev is the David & Inez Myers Professor in Computational Neuroscience and former director of the Interdisciplinary Center for Neural Computation (ICNC) at the Hebrew University of Jerusalem, where he received his B.Sc. (1973) in Math and Ph.D. (1982) in Experimental and Theoretical Neurobiology. He pursued his post-doctoral studies with Wilfrid Rall and Robert Burke (1982-1985) at the...

19 Co-Authors
Yosef Yarom
Hebrew University, Jerusalem, Israel
45 publications in common
Anat Yaron-Jakobovitch
Hebrew University

DISCOVERY

Our advanced algorithms ensure the most relevant research is delivered to users, allowing them to stay up to date, and identifies users with similar interests, enabling them to connect, discuss and collaborate.

Michael F. Atiyah and 3 others published this Original Research article.

The experience of mathematical beauty and its neural correlates
Semir Zeki, John Paul Romaya, Dionigi M.T. Benincasa and Michael F Atiyah

Follow keywords
Search for keywords to follow
Neuroaesthetics | Following
Medial orbito-frontal cortex | Following
Emotional brain | Following
Mathematical beauty | Following

506 Followers | **123 Following**

Robert T Knight
University of California, Berkeley, Berkeley, USA
67,023 views | 154 publications

Alex M Thomson
UCL School of Pharmacy, University of London, London, United Kingdom
44,399 views | 92 publications

Team Frontiers: the expertise of 150 strong

Frontiers has the best team in publishing and the most talented developers of the technology that can advance the cause of open science. We benefit from a strong pool of local talent; in 2014 we received over 1000 applications, from among which **8% of the very best** were hired. We have 157 employees from 39 countries, based largely at our headquarters at the Innovation Park of the Swiss Federal Institute of Technology (EPFL) in Lausanne. Frontiers

has a satellite office in Madrid and will establish a presence in both London and San Francisco starting in 2015.

Together we are providing the support and building the tools and platforms that our authors, editors and reviewers count on to get their jobs done efficiently, and that will contribute to promoting the research and careers of scientists and clinicians from every country in the world.





Our **headquarters** are located in the Innovation Park of the Swiss Federal Institute of Technology (EPFL) in Lausanne, Switzerland.



Photo courtesy of Alain Herzog / EPFL



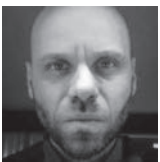
Serge Cosnier
Grenoble
University, France



**Alexander
Kokhanovsky**
EUMETSAT,
Germany



**Paolo Pietro
Bianchi**
European Institute
of Oncology, Italy



Xavier Noel
F.R.S. -F.N.R.S.,
Belgium



Laurent P. Nicod
University of
Lausanne,
Switzerland



Andrea Tipold
University of
Veterinary
Medicine, Germany



Hauke R Heekeren
Freie Universität
Berlin, Germany



Axel A Brakhage
Friedrich Schiller
University;
HKI, Germany



Ralf Buckley
Griffith University,
Australia



Pierre De Meyts
Novo Nordisk A/S,
Denmark



Pei-Yuan Qian
Hong Kong
University of Science
& Technology, China



Aki Kawasaki
Hôpital
Ophtalmique Jules
Gonin, Switzerland



Anis Feki
Hopitaux
Fribourgeois,
Switzerland



Antonio Esquinas
Hospital General
Universitario Morales
Meseguer, Spain



Terry F Davies
Icahn School of
Medicine at Mount
Sinai, USA



**Maria V Sanchez-
Vives**
ICREA-IDIBAPS,
Spain



Seung-Bok Choie
Inha University,
Korea (South)



Patrick Bouthemry
INRIA, France



**Thierry Le
Chevalier**
Institut Gustave
Roussy, France



Ken McElreavey
Institut Pasteur,
France



Manlio F. Marque
Instituto Nacional de
Cardiología Ignacio
Chavez, Mexico



Chor San H Khoo
International Life
Sciences Institute,
USA



Rudolf von Steiger
International Space
Science Institute,
Switzerland



Antonio Trincone
Consiglio
Nazionale delle
Ricerche, Italy



Alberto Diaspro
Istituto Italiano di
Tecnologia, Italy



Giorgio Metta
Istituto Italiano di
Tecnologia, Italy



Karol Osipowicz
Jefferson
Neuroscience
Hospital, USA



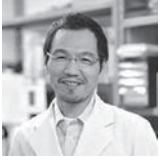
Pamela J Hornby
Johnson &
Johnson, USA



Hans Uwe Dahms
Kaohsiung Medical
University, Taiwan



John Pernow
Karolinska
Institutet, Sweden



Akihiko Ito
Kinki University,
Japan



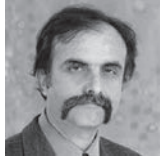
Ian Gregory
Lancaster
University, UK



Lorenza S Colzato
Leiden University,
Netherlands



Axel A Brakhage
Leiden University,
Netherlands



**Alexandre M.
Zagoskin**
Loughborough
University, UK



John R Battista
Louisiana State
University and A &
M College, USA



Andrea Sinz
Martin-Luther
University,
Germany



Osama O Zaidat
Medical College of
Wisconsin; Froedtert
Hospital, USA



Irene M. Lang
Medical University
of Vienna, Austria



**Rahn Kennedy
Bailey**
Meharry Medical
College, USA



Maria Fleseriu
Oregon Health
Science University,
USA



Huangxian Ju
Nanjing University,
China



Masaru Katoh
National Cancer
Center, Japan



How-Ran Guo
National Cheng
Kung University,
Taiwan



David S Ginley
National Renewable
Energy Laboratory,
USA



Pellegrino Musto
National Research
Council of Italy,
Italy



Camilo R Gomez
Neurological
Institute of
Alabama, USA



Toshiro Arai
Nippon Veterinary
and Life Science
University, Japan



Bradley M. Tebo
Oregon Health &
Science University,
USA



**Christopher G
Sobey**
Monash University,
Australia



Rodrigo A Gutierrez
Pontificia
Universidad Catolica
de Chile, Chile



Shripad T Revankar
Purdue University,
USA



William Cho
Queen Elizabeth
Hospital, Hong
Kong



John T Fisher
Queen's University,
Canada



Chris van Weel
Radboud University
Medical Centre,
Netherlands



Paul S Meltzer
National Cancer
Institute, USA



**Peter van de
Kerkhof**
Radboud University,
Netherlands



Kazuki Saito
RIKEN CSRS; Chiba
University, Japan



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Rush University
Medical Center,
USA



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Sanofi
Pharmaceuticals,
USA



Piet Van Riel
Radboud
University,
Netherlands



Oliver Hayden
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Jens Kossmann
Stellenbosch
University, South
Africa



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Kuljis**
Zdrav Mozak
Limitada, Chile



A.E. (Gusz) Eiben
VU University
Amsterdam,
Netherlands



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Vivekananda
Institute of Medical
Sciences, India



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Virginia Tech, USA



**Jeremy Marchant-
Forde**
US Department of
Agriculture, USA



Michael Kogut
USDA-ARS, USA



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UW-Madison, USA



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Elise Kohn
National Cancer
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Maurizio Del Poeta
Stony Brook
University, USA



Peter Witzgall
Swedish
Agricultural
University, Sweden



Laurent Pugin
Swiss RISM Office,
Switzerland



Christopher Byron
Virginia-Maryland
College of Veterinary
Medicine, USA



Marcia G Ory
Texas A&M Health
Science Center,
USA



Christine Charles
The Australian
National University,
Australia



Shashi Phoha
McGill University
Health Centre,
Canada



Per Jesper Sjöström
McGill University
Health Centre,
Canada



Gang Pan
Chinese Academy
of Sciences, China



Connie J Evashwick
George Mason University, USA



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Joel C Bornstein
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Michael E Symonds
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Miklas Scholz
The University of Salford, UK



Steven Carl Huber
USDA-ARS, USA



Bruce J West
U.S. Army Research Laboratory, USA



Walter H Kaye
UC San Diego, USA



Catherine Sautes-Fridma
UMRS 1138, France



William Ryan Chapman
University of Hawaii, USA



Diego Cazoria-Amoros
Universidad de Alicante, Spain



Mario L Diaz
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Universidad de Vigo, Spain



Marta Wilton Vasconcelos
UCP, Portugal



Fernando M B Marques
Universidade de Aveiro, Portugal



Gianluca Castelnuovo
Università Cattolica del Sacro Cuore, Italy



Ranieri Cancedda
Università di Genova, Italy



Valerio Acocella
Università Roma Tre, Italy



Joan Ramon Casas
Universitat Politècnica de Catalunya, Spain



Dominique J Dubois
Université Libre de Bruxelles, Belgium



Antoine Toubert
Université Paris Diderot, INSERM, France



Françoise Kraeber-Bodéré
University Hospital of Nantes, France



Marc Husmann
University Hospital Zurich, Switzerland



Antonino Belfiore
Magna Graecia of Catanzaro, Italy



Tapan Mehta
University of Alabama at Birmingham, USA



Lisa Y Stein
University of Alberta, Canada



David William Galbraith
University of Arizona, USA



Alessandro Lugli
University of Bern, Switzerland



Regine Hock
University of Alaska Fairbanks, USA



Ariane Bazan
Université Libre de Bruxelles, Belgium



Sheng S. Zhang
U.S. Army Research Laboratory, USA



Nicholas M Barnes
University of Birmingham, United Kingdom



Raffaele Badolato
University of Brescia, Italy



Marc Strous
University of Calgary, Canada



Stephen J Pandol
University of California, Los Angeles, USA



Charles Dinarello
University of Colorado, USA



Blanka Rogina
University of Connecticut Health Center, USA



Fintan J. McEvoy
University of Copenhagen, Denmark



Thomas E Hanson
University of Delaware, USA



Hemant K Tiwari
University of Alabama at Birmingham, USA



Paolo Pinton
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Markus Geisler
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University of Lausanne, Switzerland



Olivier Feron
University of Louvain (UCL), Belgium



Anwar Huq
University of Maryland, USA



Gerald A Meininger
University of Missouri, USA



Evgeny Y. Tsybal
University of Nebraska-Lincoln, USA



Peter F. Choong
University of Melbourne, Australia



Franco Biondi
University of Nevada, USA



Steven H Zeisel
University of North Carolina at Chapel Hill, USA



Hany M. Elsheikha
University of Nottingham, UK



Stavros K. Kakkos
University of Patras, Greece



Andrew S Day
University of Otago, New Zealand



Egidio D'Angelo
University of Pavia, Italy



Gian Paolo Rossi
University of Padova, Italy



Wendy A Peer
University of Maryland, USA



Daniilo Emilio De Rossi
University of Pisa, Italy



Claudio Cortese
University of Rome "Tor Vergata", Italy



Hubert Vaudry
University of Rouen, France



John L. Provis
University of Sheffield, UK



Anil K Seth
University of Sussex, UK



Robert W Williams
University of Tennessee Health Science Center, USA



Farhad Ravandi
University of Texas - M. D. Anderson Cancer Center, USA



Ricardo Serrão Santos
University of the Azores, Portugal



Robert Reisz
University of Toronto Mississauga, Canada



Alessandro Pegoretti
University of Trento, Italy



Anton Nijholt
University of Twente, Netherlands



Diane Pataki
University of Utah, USA



Ming D Li
University of Virginia, USA



Simon Gilroy
University of Wisconsin - Madison, USA



Roger Stupp
University of Zurich Hospital, Switzerland



Erik Ingelsson
Uppsala University, Sweden



Alessandro Minelli
University of Padova, Italy



Richard D Emes
University of Nottingham, UK

An abstract graphic consisting of a complex network of interconnected nodes and lines, forming various polygonal shapes. The nodes are represented by small black dots, and the lines are thin grey lines. The overall structure is dense and interconnected, with some areas appearing more clustered than others. The background is white, and the graphic is rendered in shades of grey.

Frontiers

EPFL Innovation Park, Building I
CH - 1015 Lausanne
Switzerland
Tel +41 21 510 17 00
Fax +41 21 510 17 01
info@frontiersin.org
www.frontiersin.org

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