

SHORT CV Josep Penuelas

Prof. Josep Penuelas is a **Research Professor of the National Research Council of Spain (CSIC)** at **CREAF** (Center for Ecological Research and Forestry Applications).

Director of the Global Ecology Unit CREAM-CSIC-UAB-UB-IEC in CREAM at Universitat Autònoma de Barcelona,

Lab Web: <http://globalecology.creaf.cat/>
<http://imbalancep-erc.creaf.cat/>

ORCID Number: 0000-0002-7215-0150

Prof. Penuelas is one of the most respected, cited and influential ecologists working today in the world; no one working in global ecology can afford not to engage with his work. Professor Josep Penuelas is internationally recognized for his innovative research on global change ecology, remote sensing and atmosphere-biosphere interactions which has had enormous impact. He is specially known for his pioneering work on the discovery of ecophysiological mechanisms linked to the use of carbon and oxygen use that helps to explain the diversity and distribution of aquatic and terrestrial plants; the development of increasingly used remote sensing techniques to assess plant and ecosystem functioning (e.g. he codeveloped the PRI, photochemical reflectance index, and the WBI, water band index, that are becoming established tools in remote sensing of natural and agricultural ecosystems); the discovery of current evidences of global change, climate change, and air pollution effects on biodiversity and structure and functioning of terrestrial ecosystems; the introduction of metabolomics in ecology, the study of the mechanisms, function and effects of volatile organic compounds emissions by plants and ecosystems, the disentangling of biogeochemical processes involved in the carbon and nutrient cycles, or the development of science and policy for a sustainable planet, among many others. This work led to a critical understanding of how environment and ecology are centrally important in managing the global environmental crisis. Prof Penuelas has also introduced seminal concepts and tools in ecology like the “elementome” or the “biogeochemical niche”, in omic sciences such as “ecometabolomics”, in remote sensing such as “photochemical reflectance index” or “water index”. He has coordinated groups of international scientists in the production of a series of influential papers on Ecology, Earth sciences, plant and animal sciences, agriculture, and the influences that human activities have on the biosphere. He also has an international reputation in other, diverse fields, such as molecular ecology, theoretical ecology, agriculture, food security, global human health, or the role of humans in precipitating global change and existential crisis during the Anthropocene. This expertise and impact is reflected in the number of Keynote and Plenary invitations in the most prestigious universities and research centres, the Prizes and Awards he has been awarded to, **his H-index which is 140, and his ca. 100.000 citations.**

Issues of study:

His research in the field of global ecology tackles scientific challenges that require high levels of interdisciplinarity. His fields of specialization are: Global ecology, remote sensing, global change, climate change, atmospheric pollution, Biogenic Volatile Organic Compounds emissions, plant ecophysiology, functioning and structure of terrestrial plants and ecosystems, chemical ecology, ecometabolomics, microbial ecology, macroecology, biogeochemistry with special focus on phosphorus, environmental sustainability, food security and global health.

Scientific publications:

Professor J. Penuelas has published **6 books on ecology**, more than **1500 papers in scientific journals and books** (more than 1000 in journals of the Science Citation Index; 93 in **Nature** journals, 8 in **Science-Science Advances**, 13 in **PNAS**, 1 in **National Science Review**, 18 in **Trends in Plant Science**, 7 in **Trends in Ecology and Evolution**, as well as in **highest profile scientific journals** in ecology and environmental sciences: 79 in **Global Change Biology**, 26 in **Global Ecology and Biogeography**, 7 in **Ecology Letters**; remote sensing: 15 in **Remote Sensing of Environment**; and plant biology: 39 in **New Phytologist**),

300 in other journals and chapters of books, and more than **270 articles on popular science**. It is also outstanding his labour popularizing science issues at international and national scale in mass media, newspapers, radio, tv and social networks. He is also generating several influencing studies to develop science and policy for a sustainable planet, including use and recycling of resources, food security, and mitigation of pollution and climate change.

Stages, teaching activities and invited seminars in international centers

Prof. Penuelas was Titular Professor of Ecology in the University of Barcelona until 1990 and is involved on seminars and postgraduate courses in many of the main national and international Universities. He has been visiting professor or visiting scientist in more than 50 universities and centers in all the continents, including for example, universities of Barcelona, Los Angeles, Washington, Duke, Lancaster, Avignon, Paris, Saint Andrews, Mexico, Tokyo, Sheffield, National Center for Atmospheric Research (Boulder Colorado), Phoenix, Flagstaff, Vancouver, Boulder, Hawaii at Moana, Mèxic, Danah Latu (Borneo), Australian National University (Canberra), Stanford, Colorado, Kuopio, British Columbia, Maryland, Católica de Chile, Northern Arizona, Tsukuba (Japan), Malaysia Sabah, Stanford, Lancaster, China Academy of Sciences, Macquarie University, NCAR Boulder, Beijing, ASU Phoenix, NAU Flagstaff, Berkeley, Stanford, Oxford, Cambridge, PNNL Richland (Washington), Antwerp University, University of Zurich, Talahua-Simiutug (Bolivar-Ecuador), Berkeley, Stanford, Cambridge, Brno, Vienna, Birmingham, Center of Molecular Plant Biology University of Delhi, Nanjin, Beijing, Tribhuvan, Athens, Oxford, He is involved on seminars and postgraduate courses in many of the main national and international Universities.

National and International recognition: scientific prizes/awards:

- Elected one of the 45 outstanding Spanish scientists in “La generación de la ley de la Ciencia. 45 perfiles de científicos de hoy” by the Spanish Ministry of Science and Technology. 2005.
- Organizer and signer of the Barcelona Declaration 2008: Challenges and Pathways to Earth Sustainability. 2008.
- Prizes (**Omnium cultural** 1975; **Omnium cultural** 1976; **Comte de Barcelona** 1990; **NASA** 1993; **Japan Ministry of Science** 1998; **Premi Medi Ambient Institut Estudis Catalans i Obra Social Caixa de Sabadell** 2008; **National Research Prize of Catalonia** 2010; **ERC-Synergy** 2013; **silver badge of the Institut d’Estudis Catalans** 2014; **Premio Rey Jaime I** 2015; **Doctor Honoris Causa by the Estonian University of Life Sciences**, Tartu, Estonia 2016; **adoptive son of Figueres** 2016; **Ramon Margalef’s Prize in Ecology** 2016; **Chair of the panel of judges for the Nature’s awards for scientific mentoring** 2017; **Chinese Academy of Sciences Distinguished Scientist** 2018; **Special mention at the Prize City of Barcelona 2017 in the class of Earth and environmental sciences** (February, 2018), **Marsh Award for Climate Change Research, British Ecological Society** (2018), **IV Excellence Prize Ramon Muntaner** 2018, **Prize City of Barcelona 2018 in the class of Earth and environmental sciences** (February, 2019), **Honour member of Biologist’s College of Catalonia** 2019, CREA accredited as centre of excellence Severo Ochoa 2019, **Nominated among the four hundred most influential scientists in all fields and among the ten most influential scientists in ecological and environmental sciences** (Meta-Research Innovation Center at Stanford – METRICS), Elected **American Geophysical Union 2020 Fellow** for his exceptional contributions in the Earth and space sciences, **Most productive ecologist of the world** (GlobalauthorID 2021 ranking).....).

Science management and editorial activities:

- He has been principal investigator or scientific coordinator of several European Union, Spanish and Catalan projects financed by public research agencies and by private funding. Among them he has been awarded recently with ERC-Synergy 2014-2020 grant.
- Supervision of young researchers: 64 PhD theses, 51 Master theses, 64 postdocs.
- He is currently member of the editorial board of the most influential scientific journals in ecology, global ecology, plant and animal sciences, atmospheric sciences and remote sensing as *Ecology Letters* (since 2004), *Global Change Biology* (since 2010), *Global Ecology and Biogeography* (2010-2018), *Trends in Plant Science* (since 2016), *New Phytologist* (since 2008), *Remote Sensing of the Environment* (since 2004), *Atmospheric Pollution Research* (since 2009), *e-Forestry* (since 2007), *Journal of Plant Ecology* (2008 - 2011), *Plant Ecology and Diversity* (since 2007), *Trees structure and function* (2013-2016), *Contributions to Science* (since 2014), *Remote Sensing* (since 2018) and *Sensors* (since 2016). He collaborates in the reviewing of articles in many scientific journals, some of them of great prestige such as *Science*, *Nature*, *Nature Geoscience*, *Nature Climate Change*, *Proceedings of National Academy of Sciences* (USA), *Trends in Ecology and Evolution*, ...).

- Scientific **advisor** of several international research centers, foundations, city councils, governments, and diverse associations... and diverse cultural activities associated to science and the dissemination of science. Member of the **Steering committee** of several European research consortia (CLIMMANI, VOCBAS, COST-TERRABITES,...).
- Member of several academies and international and national scientific associations.

Funding last 10 years:

Principal investigator (PI) or partner in 24 national and international research projects (mainly public and EU-funded): CLIMOOR, VULCAN, ALARM, ISONET, VOCBAS, NITROEUROPE, MICROCARB, CONSOLIDER-MONTES, GLOVOCS ...

Current funding:

His group is currently funded by European Research, **ERC_Synergy**, Spanish and Catalan national science agencies. Also additional funding from European foundations and institutions (AIR-Liquide,...), and Spanish institutions and foundations (BBVA, CSIC, Fundación Ramón Areces,...).

Hundreds of invited presentations and lectures in the most prestigious universities and research centers (see examples in the list above), research expeditions (from the Arctic to the tropics), and organization of international conferences