

## “UNIVERSITY OF SEVILLE – BRUKER” RESEARCH PRIZES

In order to stimulate and promote a wider use of the General Research Laboratories and Facilities and their contribution in Research activities, as well as to evaluate the impact of the General Research Support on the development of the Research Groups, the Vice Rectorate for Research of the University of Seville and Bruker-Spain have agreed on the establishment of three Prizes, which will be governed according to the following rules:

**FIRST:** The University of Seville and Bruker-Spain establish a **First Prize** with the purpose of recompense those scientific publications of high technological impact in the field of applied Nuclear Magnetic Resonance, and **two Second Prizes** with the aim of support those research projects showing an innovation character and high technological impact that will consider the use of the equipment of the Nuclear Magnetic Resonance Facility of the University of Seville. These prizes will be named “University of Seville-Bruker Research Prizes” (“Premios de Investigación Universidad de Sevilla-BRUKER”).

**SECOND:** Researchers eligible for the **First Prize** must have a published **research work** in the field of applied Nuclear Magnetic Resonance, which includes experimental measurements and development of assays by using the General Research Facilities of the University of Seville. This work must have been published between 1st January and 31st December 2019

**THIRD:** Researchers eligible for the **Second Prizes** must

present a **Research Project** based on the use of the spectrometers of the Nuclear Magnetic Resonance Facility of the University of Seville. This project must be completed within one year from the date of the Prize being awarded.

**FOURTH:** Publications presented for the First Prize must have explicitly included a text indicating the use of the Nuclear Magnetic Resonance Facility of the General Research Laboratories and Facilities of the University of Seville.

**FIFTH:** The value of the **First Prize** shall be **1,500 €**. Besides, the winners shall receive a diploma certifying the awarded prize, signed by his Excellency the Chancellor of the University of Seville.

**SIXTH:** The value of **each Second Prize** shall be **1,000 €** to cover expenses relating to the use of the equipment of the Nuclear Magnetic Resonance Facility of the University of Seville, and **up to 500 €** as travel and subsistence costs.

**SEVENTH:** Applicants shall submit the following documentation in one copy:

- 1) A **form**, properly completed, signed, and dated (available on internet at <https://citius.us.es/web/noticias.php?id=c3b69bc7>).
- 2) Applicants for First Prize shall include **a copy of the scientific publication** together with a report stating its impact in the Scientific Community. The text, no longer than two pages, can include all those considerations that the authors may deem appropriate for the evaluation of their work. Its social and technological impact and the use of the General Research Facilities shall be particularly valued.
- 3) Applicants for Second Prize shall include a **brief description** of the proposed Research Project. The text, **no longer than two pages**, shall include all those considerations that the authors may deem appropriate for the evaluation of their work. Its social and technological impact and the use of the General Research Facilities shall be particularly valued.

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- 4) These documents shall be submitted or sent to the Vice Rectorate for Research of the University of Seville (Vicerrectorado de Investigación - Pabellón de Brasil. Paseo de las Delicias, s/n, 41013 – Sevilla (Spain)) **as well as an electronic copy to [seccioncitius@us.es](mailto:seccioncitius@us.es)**.

**EIGHTH:** The competition shall be judged by a jury chaired by the Vice Rector for Research of the University of Seville and formed by four members, three of them appointed by his Excellency the Chancellor of the University of Seville; the fourth member shall be appointed by Bruker-Spain. The decision of the jury, which shall be published, shall be final and not subject to appeal.

**NINTH:** The deadline for applications is **30th September 2020**.

**TENTH:** The Prizewinners agree to give presentations of the awarded research works on the date set by the Chancellor's office.

**ELEVENTH:** The awards ceremony will take place as a public function on the date and at the place fixed by the Chancellor's office, which shall be announced to the winners in time.

# Nuclear Magnetic Resonance Facilities at CITIUS—Universidad de Sevilla



The Centre for Research, Technology, and Innovation of the University of Sevilla (CITIUS) includes the Nuclear Magnetic Resonance Facility (NMR) among its General Research Laboratories and Facilities. This Facility provides services and R&D&I actions to a large number of Research groups and companies for more than 30 years. Nowadays, it

is equipped with six NMR spectrometers: a high field spectrometer (**600 MHz Bruker Avance III wide bore**) dedicated solid-state NMR, and five spectrometers for high-resolution NMR in liquids: two of them equipped with cryoprobes (700 and 500 MHz), a second 500 MHz spectrometer and two additional 300 MHz spec-

trometers. Additionally, a seventh spectrometer (**400 MHz**) will be installed soon.

Among the liquid-state NMR systems, the **700 MHz Bruker Avance III** spectrometer is dedicated mainly to the analysis of biomolecules (proteins, nucleic acids, etc.), which require a high-field for their study, whereas both 500 MHz spectrometer (**500 MHz Bruker Avance and 500 MHz Bruker Avance III**) are usually dedicated to the study of molecules of lower molecular weight or complexity. Finally, both 300 MHz spectrometers (**300 MHz Bruker Avance and 300 MHz Bruker Avance III**) are usually used for samples that no require an exhaustive NMR study, that is, a routine spectrometry based on the acquisition of simple mono- and bi-dimensional spectra. Moreover, the Facility is equipped with **two HR-MAS probes** for both spectrometers 500 MHz Bruker Avance and 700 MHz Bruker Avance III, allowing the acquisition of NMR spectra from semi-solid or high viscous liquids (gels, suspensions, tissues...), as well as an

**HPLC-SEC-NMR** system linked to the 700 MHz spectrometer, being able to carry out chromatography coupled with high-field NMR.

Finally, a **400 MHz** spectrometer for **food metabolomics** will be installed in the coming months, which will also include a HR-MAS probe.

The activities of the Facility is enthusiastically supported in its teaching and research activities by a group of four specialist technicians and headed by Dr. Miguel Ángel Rodríguez-Carvajal.

More information at: <http://citius.us.es>



**500 MHz Bruker Avance**

- Three RF channels
- SampleXpress™ autosampler
- MAS pneumatic unit
- BCU-Xtreme cooling system
- Probes: BBFO<sup>+</sup>, TBO, BBI, QNP, HR-MAS

**LC-SPE-NMR**

- HPLC Hitachi
- SPE Prospekt2 module
- HySphere cartridges: C2-SE, C8-EC-SE, C18-HD, Resin GP, Resin SH, CN-SE, MM anion, MM cation

**500 MHz Bruker Avance III**

- Three RF channels
- BCU-05 cooling system
- Cryoplatfrom
- Cryoprobe: 5 mm TCI [<sup>1</sup>H/<sup>13</sup>C/<sup>15</sup>N/<sup>2</sup>H]

**300 MHz Bruker Avance**

- Two RF channels
- BBI [<sup>1</sup>H/X (<sup>109</sup>Ag-<sup>31</sup>P)] probe
- Selfservice

**700 MHz Bruker Avance III**

- Four RF channels
- BCU-I-40/50 cooling system
- CryoProbe QCI [<sup>1</sup>H/<sup>31</sup>P/<sup>13</sup>C/<sup>15</sup>N/<sup>2</sup>H]
- Cryofit for HPLC-SPE-NMR
- MAS pneumatic unit
- Other probes: TXI, HR-MAS

**Solid-state 600 MHz Bruker Avance III WB**

- Four RF channels
- MAS pneumatic unit
- Probes:
- 2.5 mm DVT [<sup>1</sup>H/<sup>19</sup>F/X (<sup>15</sup>N-<sup>13</sup>C)]
- 4 mm DVT [<sup>1</sup>H-X/Y (<sup>31</sup>P/<sup>29</sup>Si-<sup>23</sup>Na, <sup>27</sup>Al/<sup>29</sup>Si-<sup>17</sup>O, <sup>13</sup>C/<sup>2</sup>H-<sup>15</sup>N)]
- 4 mm DVT low gamma: <sup>109</sup>Ag-<sup>13</sup>C/<sup>1</sup>H
- 4 mm WVT [<sup>1</sup>H/X (<sup>107</sup>Ag-<sup>13</sup>C)] + booster + MgO stator

**300 MHz Bruker Avance III**

- Two RF channels
- SampleXpress™ autosampler
- Probes: BBFO, BBI, DUL