José Nicolás **Orce**

Professor of Physics



About me

I am a nuclear physicist passionate about high-quality research and teaching. My research spans fundamental nuclear physics and astrophysics, with 150+ peer-reviewed publications, approximately one-third led by me. I have explored the nuclear chart using diverse experimental techniques, including inelastic neutron, photon and electron scattering, Coulomb excitation, β decay, transfer and fusion–evaporation reactions, complemented by simulations and theoretical calculations. My research uncovered novel collective excitations with strong magnetic transitions and revealed the nuclear-physics origins of the universality of cosmic elemental abundances. As principal investigator, I secured over $3 million in research funding, run African-led experiments at CERN, and commissioned major infrastructure enabling world-class nuclear physics and astrophysics research in South Africa. My nuclear physics lectures rank at the top of global search results, providing open-access education to students and researchers worldwide.

Areas of specialization

• Fundamental Nuclear Physics & Applications • Nuclear Astrophysics • Big Data • High-Performing Calculations and Simulations

Media: Nico Orce

nuclear.uwc.ac.za
UWCNuclear(59 Repos)
Nucl. Phys. Lectures
0000-0003-1699-1761
1.7K Followers

Short Resumé

2000-02 **PhD, University of Brighton, UK**
Experimental Nuclear Physics · Shape-driving effects in triaxial nuclei

2003-10 **Postdoctoral & Research Fellow**
Kentucky, USA & TRIUMF, Canada · Assistant Professor, EKU, USA

2011–26 **Lecturer (2011-12), Associate Professor (2013-16), Full Professor (2017-26)**
Physics & Astronomy · University of the Western Cape (UWC)
CERN Associate. National Institute for Theoretical and Computational Sciences Affiliate. Honorary Visiting Professor University of York

2012-26 **PI & Grant Holder of Major Research Infrastructure Projects ($3M+)**
GAMKA Array (∼$2M) · Modern African Nuclear DEtector LAboratories (∼$1M+)
Pipeline for Coulomb-Excitation Coincidence Experiments & Development of New Beams for Nuclear Experiments. Quantum Imaging using Plastic Scintillators with Fast Digitizers

2012–26 **Spokesperson of Leading Experiments & Astronomical Observations**
CERN (IS569, IS694), TRIUMF (S1684), iThemba (PR285, PR352) · SALT (SCI-036)
Coulomb-excitation & β-Decay. Nuclear Correlations & Polarizability. Metal-Poor Stars

2021-26 **Nomination to the Margarita Salas and Kavli Prizes**
Physics, Mathematics & Engineering · ASTROPHYSICS
To Recognize International Impact, Contributing to Social Progress in an Exemplary and Extraordinary Way. The Kavli Prize Honors Scientists for Breakthroughs in Astrophysics

Stats

Publications	175	Research Gate (1.1K Interest Score)
h-index	25	Google Scholar Citations
10-index	61	Google Scholar Citations
Citations	2.1K+	Google Scholar Citations
Invited Talks	30+	Gordon, INPC, NSD, IoP, CERN
Grants	$3M+	NRF/DSI, STFC, UWC, NITheCS
Supervision	15 MSc/5 PhD	Graduates + 5 Postdocs
Alumni	100%	Employed: Industry & Academia
Lectures		Classical, Quantum, Statistical Mechanics, Waves, EM, Nuclear Structure, Astronomy
Conferences		Chair of 11× Tastes of Nuclear Physics Photometric Surveys of Southern Stars'26
Seminars		Cambridge, Oxford, UCL, Yale, Chicago,...
Comment		Young African Universities Take the Lead Nature Physics 2021

Top Recent Publications

2026 *β decay of the rp-process waiting-point nucleus ^{64}Ge*, E. Nácher *et al.* in Phys. Lett. B IF 5.0

2025 *Universality of r-process elemental abundances*, Orce in Phys. Scripta IF 2.6

2025 *Stellar Processes Driven by the Rise of Nuclear Collectivity*, Orce in Eur. Phys. J. A IF 3.0

2025 *Large deformation in ^{20}Ne challenges nuclear theory*, Mehl, Orce *et al.* in Phys. Rev. C IF 3.3

2025 *Triaxial nuclear shapes from simple ratios of E2 matrix elements*, Lawrie & Orce in ADNDT IF 3.5

2025 *Subshell gaps & onsets of collectivity from pairing gap correlations*, Orce in ADNDT IF 3.5

2024 *Electric dipole polarizability of excited states in nuclei*, Orce & Ngwetsheni in JPhysG IF 3.5

2023 *Symmetry energy bears universality of r-process abundances*, Orce *et al.* in MNRAS IF 5.2

Editorial

2022–26 **Editorial Board Member**
Atomic Data & Nuclear Data Tables · CiteScore 6.0. IF 3.5
Special 55^{th} Anniversary Edition

2011–26 **Referee & External Reviewer**
APS, WS, Elsevier, Springer, IoP · PhD theses
NRF, CERN, iThemba LABS, CSIC, DOE, NNSA, NSF, NSERC

2027 **Upcoming Monograph**
Nuclei through the Eyes of Quanta · World Scientific
How Discoveries are Made

Recent Talks

Sep 2026 "Synergies with HIE-ISOLDE" at Light Ion Collisions (Heidelberg, Germany)

Jun 2026 "Nuclear clustering" at Cluster'26 (IoP, London, UK)

Dec 2025 "The shape of ^{20}Ne" Light Ion Collisions at the LHC (CERN, Switzerland)

Jul 2025 "Universality of r-process elemental abundances" (UCL, London, UK)

Jul 2025 "Exploring the conditions for triaxial shapes", (Manchester, UK).

May 2024 "Structure & dynamics of the GDR at low T", *NSD* (Valencia, Spain)

Jan 2024 "The GAMKA spectrometer", *INTRANS Workshop* (Paris, France)

Sep 2023 "What if the symmetry energy is larger?", *NuSym23* (GSI, Germany)

May 2023 "Enhancement of oblate collectivity in ^{66}Ge", IoP (London, UK)

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