Fecha del CVA	13.01.2020

Parte A. DATOS PERSONALES

Nombre y apellidos	Andrea Jungclaus		
DNI/NIE/pasaporte	X3828807C	Edad	52
Núm. identificación del investigador		Researcher ID	
		Código Orcid	

A.1. Situación profesional actual

Organismo	Consejo Superior de Investigaciones Científicas - CSIC		
Dpto./Centro	Instituto de Estructura de la Materia		
Dirección	Calle Serrano 113bis, 28006 Madrid		
Teléfono	91 561 6800	correo electrónico	andrea.jungclaus@csic.es
Categoría profesional	Investigadora Científica	Fecha inicio	30/04/2008
Espec. cód. UNESCO	2207:FISICA ATOMICA Y NUCLEAR		
Palabras clave	estructura nuclear, espectroscopía gamma, propiedades electromagnéticas		

A.2. Formación académica *(título, institución, fecha)*

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciatura en Físicas	Universität Göttingen, Alemania	1991
Doctorado	Universität Göttingen, Alemania	1994
Habilitación alemana	Universität Göttingen, Alemania	2000

A.3. Indicadores generales de calidad de la producción científica *(véanse instrucciones)*

Cuatro sexenios de investigación (1990-1995, 1996-2001, 2002-2007, 2008-2013), el quinto solicitado.
Seis tesis doctorales dirigidas en los últimos 10 años (A. Fernández desde 12/16, V. Vaquero 2018, J. Taprogge 2015, A. Illana 2014, J. Walker 2011, V. Modamio 2010)
4095 citas totales, >350 citas/año durante los últimos 5 años, índice h=33, >270 publicaciones (fuente: WOS), >50 con uno de mis estudiantes o yo como primer autor

Entre las publicaciones se encuentran
1 *Nature* (Impact Factor: 38.6)
23 *Physical Review Letters* (IF: 7.9) – 5 con uno de mis estudiantes o yo como primer autor
19 *Physics Letters B* (IF: 4.6) - 4 con uno de mis estudiantes o yo como primer autor
90 *Physical Review C* (IF: 3.7) - 23 con uno de mis estudiantes o yo como primer autor

Parte B. RESUMEN LIBRE DEL CURRÍCULUM *(máximo 3500 caracteres, incluyendo espacios en blanco)*

1990-1994: I started my scientific career at the University of Göttingen (Germany) in the group of Prof. K.-P. Lieb working in the field of high-spin physics for my diploma thesis. After that I received a PhD fellowship of the Institut Laue-Langevin (ILL, Grenoble, France) to study the structure of atomic nuclei populated after thermal neutron capture at the research reactor of the ILL. During this time I spent several months at the Brookhaven National Laboratory and the University of Kentucky to perform complementary experiments.
1994-2001: After having received my PhD in 1994 I returned to the University of Göttingen to join the group of Prof. Lieb. During this period I was responsible for the nuclear physics activities of the group, in particular the realization of experiments at different laboratories outside Göttingen, the supervision of the diploma and PhD students of the nuclear physics part of the group and the preparation of project applications. The focus of my scientific interest at that time has been the study of neutron-deficient nuclei in the mass A~90 region with special emphasis on the measurement of electromagnetic properties of high-spin states, such as transition probabilities (which can be deduced from experimentally determined lifetimes) and magnetic moments. We performed experiments at several European laboratories such as the LNL Legnaro (Padova, Italy) and the IReS Strasbourg (France) and used state-of-the-art γ-ray spectrometer such as GASP and in particular EUROBALL. In

2000, at the end of this section of my career, I was awarded the german Habilitation, the Venia Legendi for Physics.
Since 2001: After having been awarded the Habilitation at the University of Göttingen, I received one of the prestigious Heisenberg fellowships of the Deutsche Forschungsgemeinschaft (DFG), which are meant to bridge the time between the Habilitation and the first appointment as University Professor. I decided to realize my work in Madrid, sharing my time between the Universidad Autónoma de Madrid (UAM) and the Instituto de Estructura de la Materia (IEM-CSIC). In the 2002 call, I obtained a Ramón y Cajal (RyC) fellowship which I assumed in January 2004 at the UAM. Finally, in 2007, I won the selection process for a position as Investigador Científico at the IEM-CSIC where I am now working since April 2008.
During this period I was working on several different aspects of nuclear structure physics: The study of high-spin states in neutron-rich nuclei using incomplete fusion reactions and the GASP γ-ray spectrometer at the LNL Legnaro (PhD V. Modamio), the study of electromagnetic properties of stable tin isotopes at GSI (Darmstadt, Germany) (PhD J. Walker) and the development of methods to measure magnetic moments of short-lived excited states using radioactive ion beams at REX-ISOLDE (CERN, Suiza) (PhD A. Illana). However, the main focus of my activities has been the decay spectroscopy of neutron-rich nuclei in the region around doubly-magic ^{132}Sn. I have been spokesperson of two extremely successful experiments, performed at GSI in 2006 within the RISING campaign (PhD L. Caceres) and at RIKEN (Tokyo, Japón) in 2012 within the EURICA project (PhD J. Taprogge), which both lead to a large number of publications in high-quality scientific journals. In 2015 and 2018, we complemented our studies in the ^{132}Sn region using in-beam γ-ray spectroscopy at relativistic energies at RIKEN (PhD V. Vaquero) and in 2017 the AGATA tracking array was used at GANIL to study α-cluster states in ^{212}Po (PhD A. Fernández).

To summarize I am working since 30 years in the field of nuclear structure physics using γ-ray spectroscopy as the most important tool. I performed innumerable experiments (in many of them acting as spokesperson) at nearly all international laboratories in the field and using state-of-the-art instrumentation.

Parte C. MÉRITOS MÁS RELEVANTES *(ordenados por tipología)*

C.1. Publicaciones

1) **A. Jungclaus** et al. 61/1
Observation of a γ-decaying millisecond isomeric state in $^{128}Cd_{80}$
Physics Letters B 772, 483 (2017)
This article discusses the observation of a millisecond isomeric state in ^{128}Cd which only has been possible thanks to a very involved and innovative data analysis. The new results reinforced the conclusions from our previous work that adjustments of the pairing and multipole parts of the effective shell-model interaction derived from the CD-Bonn nucleon-nucleon potential are required in order to describe the properties of nuclei around ^{132}Sn.

2) V. Vaquero, **A. Jungclaus** et al. 33/2
Gamma Decay of Unbound Neutron-Hole States in ^{133}Sn
Physical Review Letters 118, 202502 (2017)
This work, which is part of the PhD work of Victor Vaquero, reports on the observation of the gamma decay of unbound neutron-hole states in ^{133}Sn. The ability of electromagnetic decay to compete with neutron emission at energies as high as 3 MeV above threshold is attributed to a mismatch between the wave functions of the initial and final states in the latter case (11 cites).

3) G. Lorusso, S. Nishimura, Z.Y. Xu, **A. Jungclaus** et al. 55/4
β-Decay half-lives of 110 neutron-rich nuclei across the N=82 Shell Gap: Implications for the mechanism and universality of the astrophysical r process
Physical Review Letters 114, 192501 (2015)

Here we present a systematic measurement of the half-lives of 110 very neutron-rich nuclei in the region of the path of the astrophysical *r* process. It is demonstrated that the use of experimental half-life information as input in the astrophysical simulations allows to confine the possible site of the astrophysical *r* process (90 cites).

4) J. Taprogge, **A. Jungclaus** et al. 61/2
Identification of a millisecond isomeric state in $^{129}Cd_{81}$ *via the detection of internal conversion and Compton electrons*
Physics Letters B 738, 223 (2014)
In this article we used a new technique, namely the observation of internal conversion electrons in an active stopper, to identify a millisecond isomeric state in ^{129}Cd. The work is part of the PhD thesis of Jan Taprogge (16 cites).

5) G. S. Simpson, G. Gey, **A. Jungclaus** et al. 51/3
Yrast 6^+ *Seniority Isomers of* $^{136,138}Sn$
Physical Review Letters 113, 132502 (2014)
The first observation of isomeric decays in the very neutron-rich semi-magic Sn isotopes ^{136,138}Sn is one of the highlights of our EURICA experiment NP1112-RIBF85 performed at RIKEN (Tokyo, Japan) in 2012 (44 cites).

6) J. Taprogge, **A. Jungclaus** et al. 60/2
$1p_{3/2}$ *proton-hole state in* ^{132}Sn *and the shell structure along N=82*
Physical Review Letters 112, 132501 (2014)
This work, which is part of the PhD work of Jan Taprogge, reports on the identification of the position of the $1p_{3/2}$ proton-hole state in the doubly-magic ^{132}Sn core, which plays a crucial role for the structure of the N=82 isotones in the region of the r-process path. The new experimental information allowed us to study for the first time the evolution of the N=82 shell gap and the proton subshell structure along N=82 within the nuclear shell model (35 cites).

7) B. Cederwall et al. 57/35
Evidence for a spin-aligned neutron-proton paired phase from the level structure of ^{92}Pd
Nature 469, 68 (2011)
We studied the structure of the very proton-rich nucleus ^{92}Pd, with an equal amount of neutrons and protons (N=Z), which differs markedly from what has so far been observed in all the known atomic nuclei. In this exotic atomic nucleus strongly coupled proton-neutron pairs have a decisive influence on the structure of low-lying excited states. In other atomic nuclei, neutron-neutron and proton-proton pairs dominate instead, which provide properties similar to superfluid helium and superconducting solids (111 cites).

8) **A. Jungclaus** et al. 25/1
Evidence for reduced collectivity around the neutron mid-shell in the stable even-mass Sn isotopes from new lifetime measurements
Physics Letters B695, 110 (2011)
This work reports on the precise measurements of the lifetimes of the first excited 2^+ states in the stable even-*A* Sn isotopes $^{112–124}$Sn using the Doppler shift attenuation technique. For the isotopes ^{112}Sn, ^{114}Sn and ^{116}Sn the $E2$ transition strengths deduced from the measured lifetimes indicate a shallow minimum at N = 66. The observed deviation from a maximum at mid-shell as expected in a simply seniority scheme is attributed to the obstructive effect of the $s_{1/2}$ neutron orbital in generating collectivity when near the Fermi level (50 cites).

9) T.R. Rodríguez, J.L. Egido and **A. Jungclaus** 3/3
On the origin of the anomalous behaviour of 2^+ *excitation energies in the neutron-rich Cd isotopes*
Physics Letters B668, 410 (2008)
In this work we trace the origin of the unusual behaviour of the energies of the first excited 2^+ states in neutron-rich Cd isotopes approaching the N=82 shell closure using modern beyond mean field techniques and the Gogny force. We demonstrate that the low 2^+ excitation energy in ^{128}Cd is a consequence of the doubly magic character of this nucleus for oblate deformation favoring thereby prolate configurations rather than spherical ones (31 cites).

10) **A. Jungclaus** et al. 52/1
First observation of isomeric decays in the r-process waiting-point nucleus ^{130}Cd
Physical Review Letters 99, 132501 (2007)
This article reports on the first observation of isomeric decays in ^{130}Cd, making this isotope at the time of publication the most neutron-rich (exotic) nucleus with closed N=82 neutron shell for which information on excited states was available. The comparison of the experimental results to calculations performed within the nuclear shell model demonstrated that the size of the N=82 gap remains unchanged in this nucleus – in contrast to claims of several authors at that time. This finding had severe consequences in view of the *r* process of nucleosynthesis, in which ^{130}Cd plays a crucial role as one of the waiting-point nuclei (123 cites).

C.2. Proyectos

Title: Estudios experimentales y teóricos de la estructura de núcleos exóticos
Source: FPA2017-84756-C4-2-P
Period: 2018-2020
Main researchers: **Andrea Jungclaus, José Luis Egido**
Members of the project: Andrea Jungclaus, José Luis Egido
Financial volume: 120.000,00 €

Title: Nuclear structure research in exotic nuclei: Experimental and theoretical studies and instrumental developments for AGATA
Source: FPA2014-57196-C5-4-P
Period: 2015-2017
Main researcher: **Andrea Jungclaus**
Members of the project: Andrea Jungclaus, Enrique Nácher (Titulado Superior Especializado, 50%)
Financial volume: 145.200,00 €

Title: The study of exotic nuclei using gamma-ray spectroscopy
Source: FPA2011-29854-C04-01
Period: 2012-2014
Main researcher: **Andrea Jungclaus**
Members of the project: Andrea Jungclaus, Riccardo Orlandi (PostDoc), Andrés Illana (PhD student), Enrique Nácher (Titulado Superior Especializado, 50%)
Financial volume: 341.825,00 €
A. Jungclaus is also IP of the coordinated project FPA2011-29854-C04 consisting of four subprojects.
Total volume: 1.058.750 €

Title: The study of exotic nuclei using gamma-ray spectroscopy
Source: DGI-MCI FPA2009-13377-C02-02
Period: 2010-2011
Main researcher: **Andrea Jungclaus**
Members of the project: Andrea Jungclaus, Jennifer Walker (PhD student), Victor Modamio (PhD student)
Financial volume: 180.048,00 €

Title: Estructura nuclear de núcleos exóticos
Source: DGI-MEC FPA2007-66069
Period: 2008-2009
Main researcher: J. Luis Egido de los Rios
Financial volume: 262.812 €