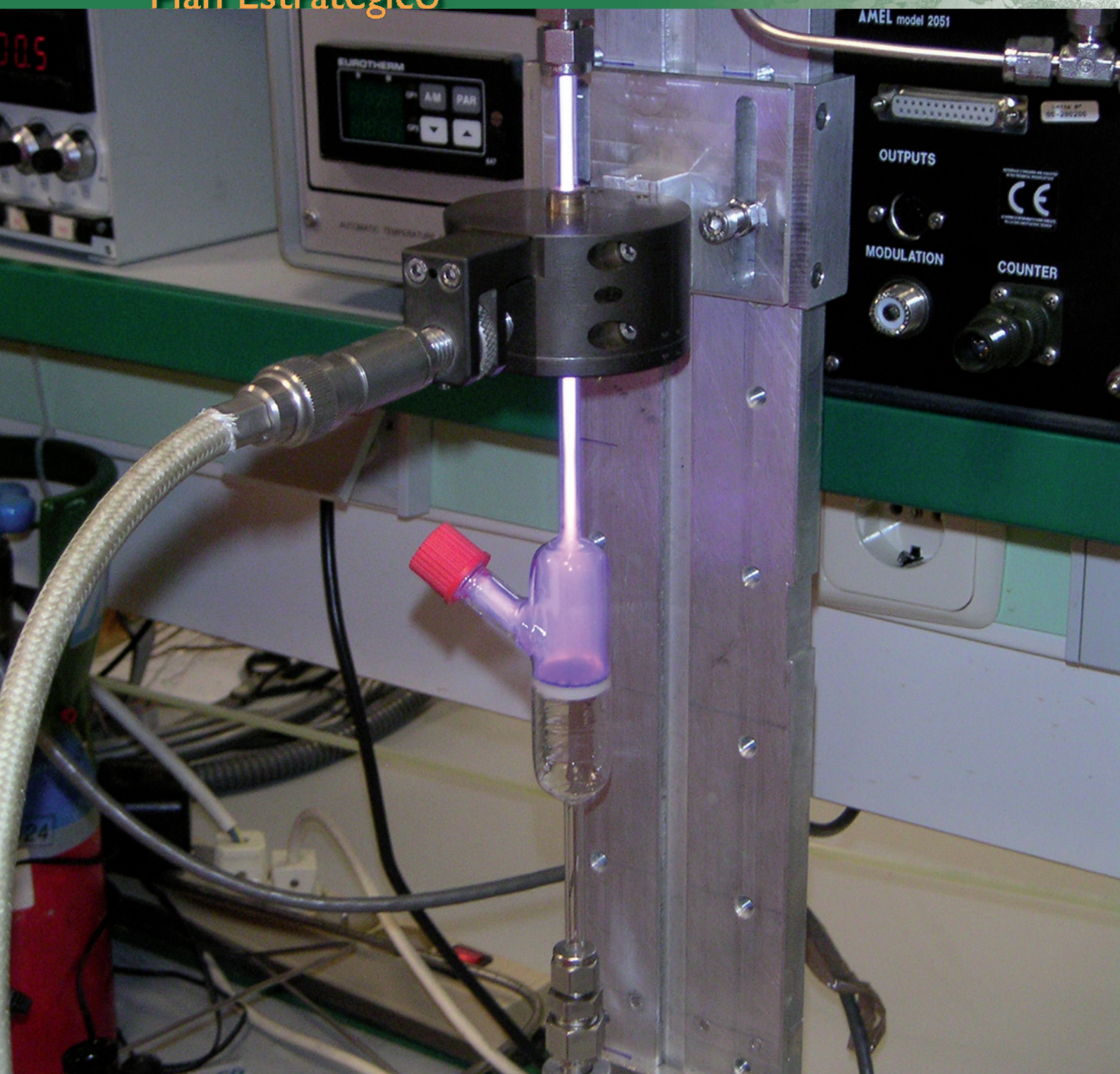


Instituto de Ciencia de Materiales de Sevilla (ICMS)

Plan Estratégico



PLAN DE ACTUACIÓN 2010-2013

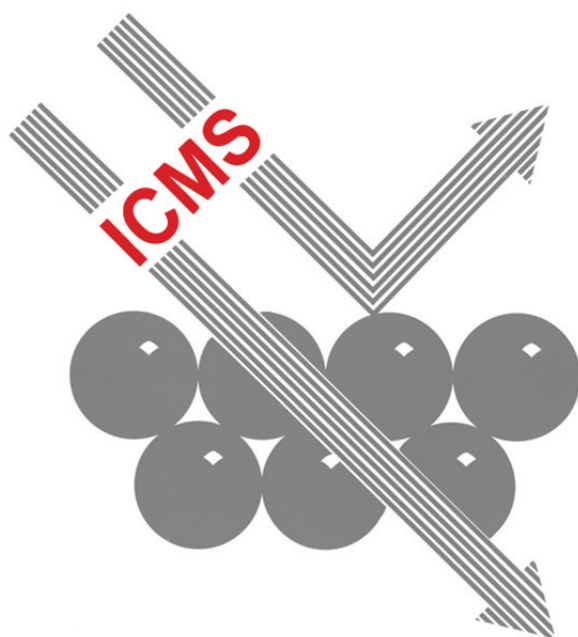
**CONSEJO SUPERIOR
DE INVESTIGACIONES
CIENTÍFICAS**





Plan de Actuación 2010 2013

Powered by Fundación General CSIC



ICMS

Instituto de Ciencia de Materiales de Sevilla



General description

Identification Data

Name :

Instituto de Ciencia de Materiales de Sevilla

Address:

C/ Americo Vespucio nº 49, 41092 Isla de la Cartuja (Sevilla)

Phones:

954489500 (Switchboard)

954489527 (Address)

-- (Manager)

Director:

Asunción Fernández Camacho - director.icms@csic.es

Vicedirectors:

Adela Muñoz Páez

Manager:

-- - [--](#)

Web:

<http://www.icmse.csic.es/>

Govern mode:

Centro Mixto CSIC - Univ. Sevilla

Participating Institutions

Name:

UNIVERSIDAD DE SEVILLA

Brief history

Date of creation :

1986-06-26

Who created it :

CSIC y Universidad de Sevilla

Who was its first director :

Prof.Dr.Guillermo Munuera Contreras

Goals :

Joint-centre CSIC-US. Research Institute

**Extended description :**

The Materials Science Institute of Sevilla (ICMS) is a joint-centre of the Spanish Research Council (CSIC) and the University of Seville (US) founded by a 'Specific Agreement' signed between the CSIC and the US in June 1986 and renewed in July 1998. The scientific personnel comprises research staff of the CSIC and research and teaching staff of the Inorganic Chemistry and Condensed Matter Physics Departments of the US, in accord with the structure described in the corresponding paragraph. The ICMS was created in June 1986 as part of a Materials Science program of the CSIC based on the Coordinated Centre 'Physical and Chemical Research Department' set up between the CSIC and the Inorganic Chemistry and Condensed Matter Physics Departments of the US. The laboratories were initially located within the premises of the two University Departments, and were extended by the ICMS taking over some space located in the IRNAS (Natural Resources and Agrobiology Institute, Seville) of the CSIC. At that time some IRNAS researchers were transferred to the ICMS. The installations and laboratories were dispersed in different buildings on the 'Reina Mercedes' campus of the US. The situation remained so until autumn 1996, when the Institute moved to its current location at the Cartuja INSEL. The researchers of the Condensed Matter Physics Department remained at Reina Mercedes receiving the new statement of 'External Unit' of the Institute. At that moment, some of the researchers also left the ICMS to join the newly created Institute for Chemical Research (IIQ). When the current structure of the Institute was established in 1996, the entire staff of the ICMS (except for the External Unit) transferred to a new building at the Cartuja INSEL. At this location the ICMS, together with another two Institutes -- the IIQ (Institute for Chemical Research) and the IBVF (Institute for Plant Biology and Photosynthesis)-- constitute the 'Isla de la Cartuja Research Centre', under an agreement between the CSIC, the US, and the regional government (the Junta de Andalucía) (JA). The centre is located in the 'Cartuja 93' scientific and technological park. This is an urban development project at the regional (Andalusian) level to foment technological enterprise.

Structure**Description :**

The ICMS is a joint Institute of the CSIC and the University of Seville. It is located at the Service Centre 'Isla de la Cartuja Research Centre' (CICIC), created under an agreement of the CSIC, the US, and the JA (Andalusian regional government). It has an External Unit on the 'Reina Mercedes' campus of the US.

- Organisation Chart ?

Direction ---Institute Board ---Scientific board

Research units ---Support unit

? The managing body consists of the Director and a Vice-director (one of whom may belong to the CSIC and the other one to the US).

? The management is assisted by an Institute Board comprising the following members:

-The Director of the Institute acting as Chairperson of the Institute Board.

-The Vice-director of the Institute.

-One representative from each Department (Research Unit).

-One representative of the scientific staff of the CSIC.

-One representative of the permanent scientific staff of the US.

-One representative of the technical and support unit personnel.

? The Scientific Board has a consultant status for the Institute Board, and comprises all the PhDs of the Institute at the Cartuja Centre, together with partial representation from the External Unit.

? The Departments or Research Units at the Cartuja Centre:

---Synthesis and Reactivity of Materials. ICMS-Cartuja.

---Surfaces and Interfaces. ICMS-Cartuja.



---Structure and Catalysis. ICMS-Cartuja

? The Institute also has a Support Unit consisting of the ?Administration and Management Unit?, the ?Workshops? and the ?Materials Characterisation Services?:

---Administration and Management

i) Administration (this unit is small, due to the existence of a general administration unit in the CICIC Service Centre).

ii) IT (small unit due to the existence of a general IT unit in the CICIC Service Centre).

---Workshops

i) Electronics workshop

ii) Mechanics workshop

---Materials Characterisation Services

Comprises the general characterization services of the Institute.

? General Maintenance and Library Services are provided by the CICIC.

? General Administration and IT Services are provided by the CICIC.

? General Safety Service is provided by the CSIC.

In the present strategic plan a new structure is proposed based in the creation of five research lines associated to new Departments or Research Units. The proposed reorganization is based on the integration of 8 researchers from the external unit, with Solid State Physics background, to the Cartuja Centre. This new structure constitutes the main strategy presented in this Plan and aims to improve the connexion between Solid State physicists and chemists and to improve the integration of the personnel from the University of Seville and the CSIC in the joint Institute. This strategy will favour the integration and the achievement of critical mass for approaching more challenged research projects. The defined research lines that also correspond to planned research units or departments, are the following:

--Tailored Nanomaterials and Microstructure

-- Mechanochemistry and Reactivity of Materials

-- Nanostructured materials for functional properties and applications

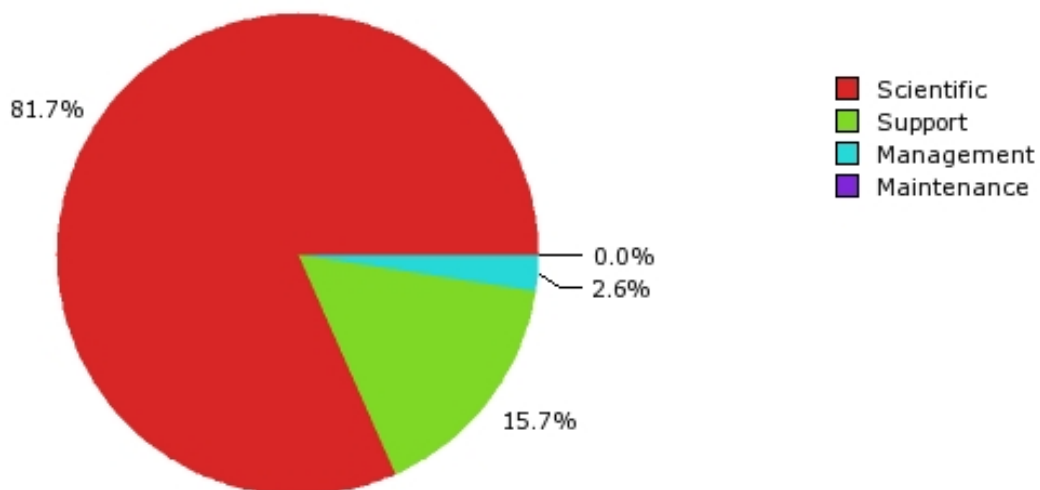
-- Catalysis for environment and energy

-- Engineered Ceramics for Extreme Environments

The proposed structure ubicates all the research carried out in the Institute into five independent research lines. A general line for the Institute itself is not included because the research lines and research groups seek for their own financial support. The strategic plan aims to promote integrated research focussed on the identified main research lines and objectives. The own resources of the Institute, like personnel and equipment, will be focussed in the next period to potentiate the identified research objectives associated to the research lines.



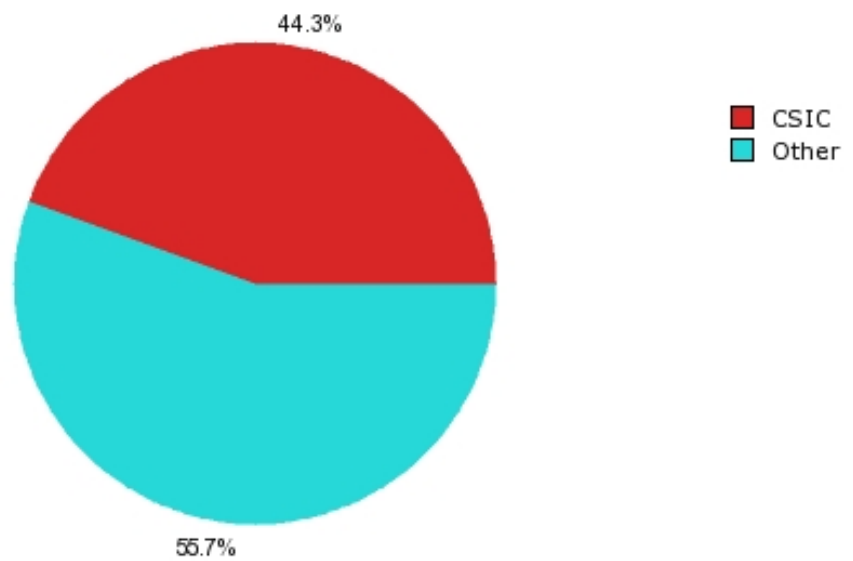
Staff



	Male	Female	TOTAL
Scientific	56 (60%)	38 (40%)	94 (100%)
Support	10 (56%)	8 (44%)	18 (100%)
Management	1 (33%)	2 (67%)	3 (100%)
Maintenance	0	0	0
TOTAL	67 (58%)	48 (42%)	115 (100%)

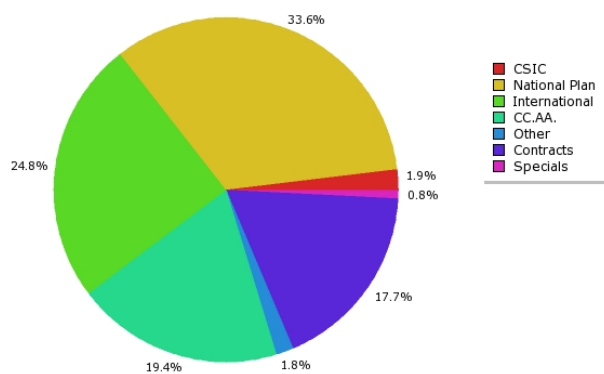
Scientific personnel by type

		Male	Female	TOTAL
Scientific Civil Servant	Research Professor	3 - (75%)%	1 (25%)	4 (100%)
	Research Scientist	6 - (100%)%	0 (0%)	6 (100%)
	Tenured Scientist	8 - (53%)%	7 (47%)	15 (100%)
	Full University Professor	3 - (75%)%	1 (25%)	4 (100%)
	University Professor	8 - (89%)%	1 (11%)	9 (100%)
	Other	0 - %	0	0
Scientific Hired	Ramón y Cajal	0 - (0%)%	1 (100%)	1 (100%)
	JAEDOC	4 - (80%)%	1 (20%)	5 (100%)
	Other	8 - (42%)%	11 (58%)	19 (100%)
Scientific Training	JAEPREDOC	3 - (38%)%	5 (63%)	8 (100%)
	Other	13 - (57%)%	10 (43%)	23 (100%)
Scientific personnel		56 - (60%)%	38 (40%)	94 (100%)

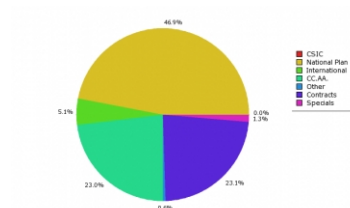
Staff by payer organization

Funding by type

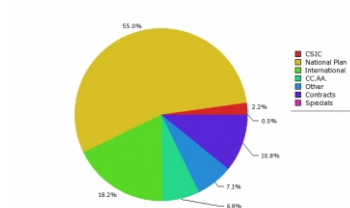
YEAR : 2003,2004,2005,2006,2007



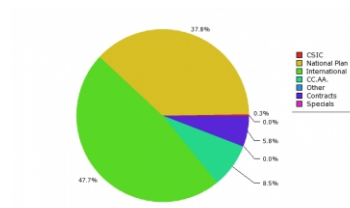
YEAR : 2003



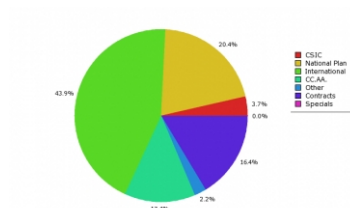
YEAR : 2004



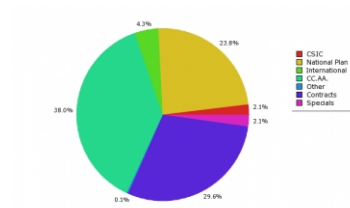
YEAR : 2005



YEAR : 2006



YEAR : 2007

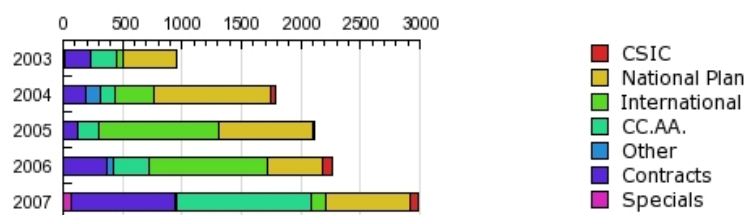




Funding by type

		2003	2004	2005	2006	2007	TOTAL
CSIC		0	39	6	84	62	191
National Plan		445	979	798	462	711	3396
International		48	324	1005	996	128	2502
CCAA		218	121	178	303	1134	1955
Other		6	126	0	51	2	185
Contracts		220	193	122	371	884	1789
Specials	Consolider	0	0	0	0	0	0
	Cenit	0	0	0	0	0	0
	Ciber	0	0	0	0	0	0
	Profit	12	0	0	0	64	76
	Petri	0	0	0	0	0	0
	Large Instalations	0	0	0	0	0	0
	Subtotal	12	0	0	0	64	76
TOTAL		950	1782	2109	2267	2985	10093

Funding by type/year

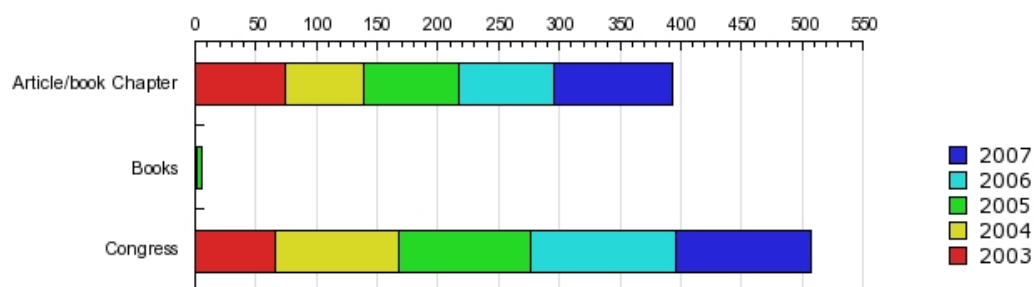


Data in (K€)	2003	2004	2005	2006	2007	TOTAL
CSIC	0	39	6	84	62	191
National Plan	445	979	798	462	711	3396
International	48	324	1005	996	128	2502
CC.AA.	218	121	178	303	1134	1955
Other	6	126	0	51	2	185
Contracts	220	193	122	371	884	1789
Specials	12	0	0	0	64	76

Publications

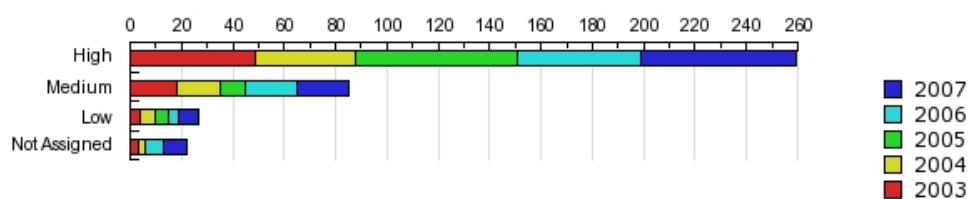
Publications by type

Publications by type						
Type	2003	2004	2005	2006	2007	Total
Article/Book chapter	74	65	78	79	97	393
Books	2	0	3	0	1	6
Congress	66	102	108	120	111	507
TOTAL	142	167	189	199	209	906



Article / Book chapters by impact

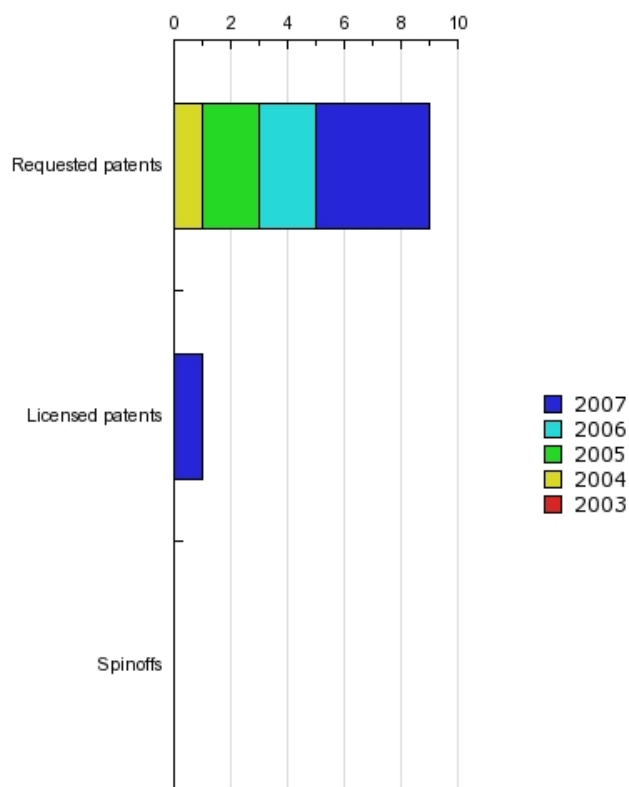
Article / Book chapters by impact							
Type	2003	2004	2005	2006	2007	Total	
HIGH	49	39	63	48	60	259	
MEDIUM	18	17	10	20	20	85	
LOW	4	6	5	4	8	27	
Not assigned	3	3	0	7	9	22	
TOTAL	74	65	78	79	97	393	





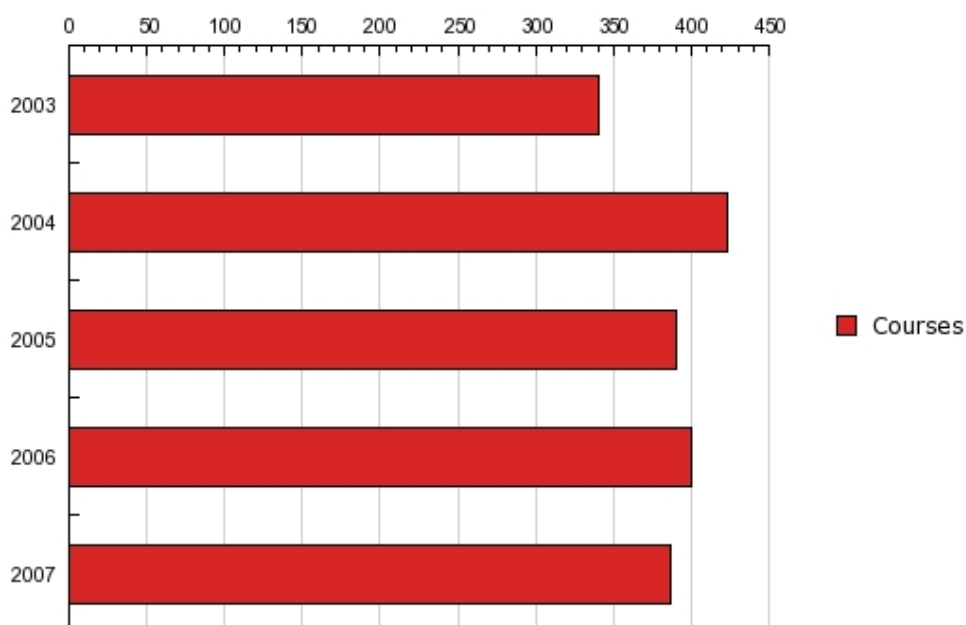
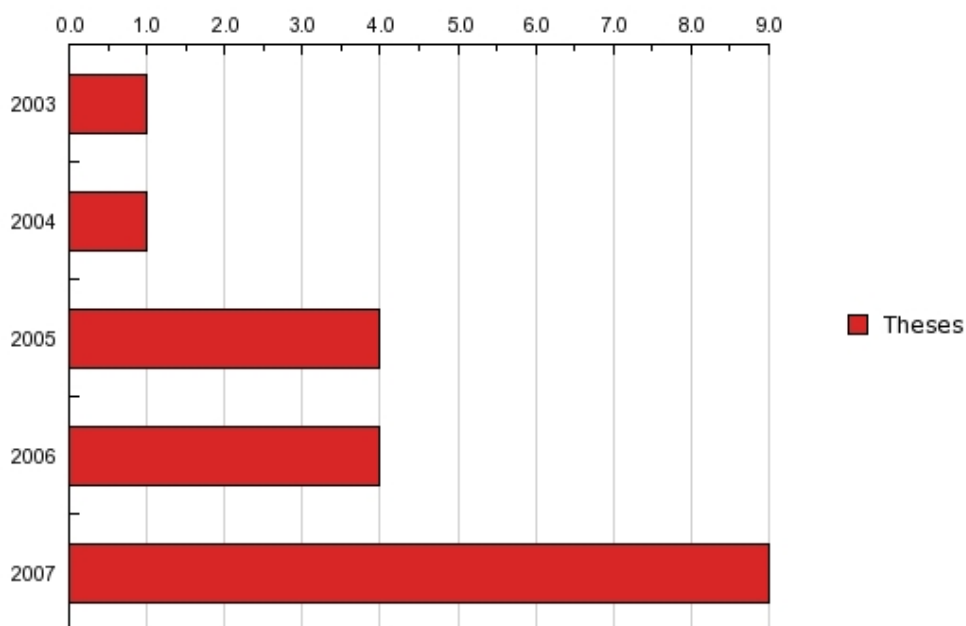
Knowledge Transfer

Licensed patents						
Type	2003	2004	2005	2006	2007	Total
Requested patents	0	1	2	2	4	9
Licensed patents	0	0	0	0	1	1
Spinoffs	0	0	0	0	0	0
TOTAL	0	1	2	2	5	10



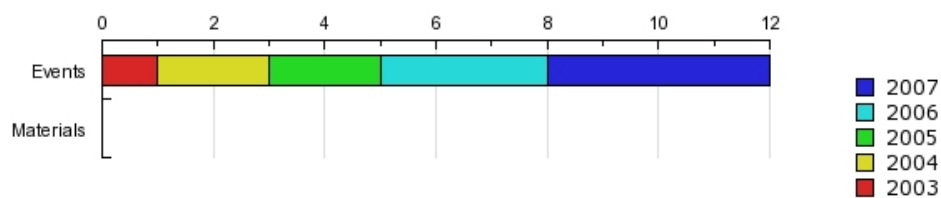
Training by type

Training by type						
Type	2003	2004	2005	2006	2007	Total
Theses	1	1	4	4	9	19
Courses (hours)	341	423	390	400	387	1941
TOTAL	342	424	394	404	396	1960



Science divulgation activities

Science divulgation activities						
Type	2003	2004	2005	2006	2007	Total
Events	1	2	2	3	4	12
Materials	0	0	0	0	0	0
TOTAL	1	2	2	3	4	12



SWOT

Weaknesses

- Resources: Personnel
 - The shortage of technical personnel is a general weakness in all Institutes. At the ICMS the actual ratio of permanent researchers to permanent technicians is 4.2
 - The average age of permanent scientific personnel in the ICMS is as follows: University Professors (55), Research Professors (60), Scientific researchers (45), University Lecturers (53), Tenured scientists (43). It is necessary to incorporate new young researchers to maintain the number of permanent researchers and to improve the development of innovative research.
 - Lack of qualified personnel for managing highly demanding projects like CENIT, CONSOLIDER or FP European projects.
- Resources: Infrastructures
 - Most of the scientific equipments are obsolete with more than 10 years of usage. In addition to the required substitutions also new equipments with forefront capabilities are necessary to keep the high level at the materials characterization services of the ICMS.
 - Lack of good maintenance services for big equipments and insufficient repairs budget.
 - Total saturation of space in laboratories and offices. Although the construction of a new building is planned to start in January 2009, the situation will be very difficult for the next 4 years.
- Scientific and technological production
 - Impact index of the Institute publications in a medium rate as compared to the average value in the Materials Science Area of the CSIC
 - The demand of cooperation from local industrial environment is very limited. The Institute needs to improve its technological offer.
- The research strategy
 - The ICMSE is deficient regarding the new trends in science and technology directed towards more-applied research and technology transfer initiatives.
 - Small size of the research groups and lack of interconnection between them what difficult the achievement of critical mass for the consecution of ambitious projects.
 - Although the ICMS participate in many small bilateral cooperation programs, the participation in bigger multilateral international projects financed by European programs is still low for many groups.

Threats

- Development of the scientific and technical careers
 - The low salary of the scientific and technical personnel is a real threat for the incorporation of new researchers and technicians of high qualification.
 - The promotion system in the scientific career favours atomization of research groups. Challenged and risked research topics may not be clearly identified and appreciated.
 - Lack of incentives to technical personnel for improving their career.
- Visibility and recruitment of personnel
 - Materials Science is a discipline with less visibility than other topics of higher social impact.
 - Difficulties to recruit students with higher academic qualifications. Decrease in the student number at the Science Faculties
- Competitiveness and lack of integration
 - Opening of new research and technological centres which also compete for resources and funds.
 - Lack of integration with the other Institutes in the Materials Science division of the CSIC
- Financial and economical context
 - Shortage of the industrial sector investment in R+D+i.
 - End of the European funding program for less-favoured regions (FEDER) in Andalusia.



- The actual uncertainty in the availability of research funds makes the researchers to be less ambitious in their objectives for funds capture.
- Increasing managing tasks
 - Managing of projects is becoming extremely time-consuming for researchers. Increasing complexity of audits and reporting tasks.

Strengths

- Resources: Personnel
 - The actual number of permanent scientific personnel in the ICMS-Cartuja is 38 people mainly with a Chemistry degree. The incorporation of 8 researchers with Physics degree coming from the External Unit, constitutes a very valuable and multidisciplinary team. The number of researchers is in the average value of the Institutes in the Material Science Area and provides the ICMS with a valuable critical mass to approach new strategies and research trends.
- Resources: Infrastructures
 - Many microstructural and chemical characterisation techniques are available as general services. In particular services on: Spectroscopies (UV-VIS, FTIR, Raman, NMR), Physi- and Chemi-sorption, Thermogravimetry, Electron microscopies, X-Ray diffraction, Surface analysis.
 - Full access to service facilities of the Sevilla University (CITIUS). There is also access to the National Centre of Accelerators (CNA), Synchrotrons and other large installation facilities.
- Resources: Funding from competitive programs
 - The ICMS has a regular and constant income of funds from National Research Programs, partially from European Framework Programs and particularly in the last three years from regional Andalusian programs in which a high level of success is being achieved by the Institute.
- Academic environment
 - The ICMS is a joint CSIC-US Institute, which enables an optimal involvement of their researchers in the University environment (recruitment of Fellows, doctoral courses, masters, etc.).
- High Scientific and Technical Production at regional level
 - The ICMS has a regular and constant production of refereed scientific publications and technical production which is in a medium level at National context and high level in the Andalusian region scenario. This makes the Institute in a good position to get funds from the regional programs.
- Integration in the CICIC and the Cartuja 93 Technological Park
 - The ICMS is a part of the interdisciplinary centre of scientific research 'Isla de la Cartuja', sited in a technological park, opening the door to a wide variety of scientific capabilities, opportunities, and multidisciplinary collaborations.

Opportunities

- National and European programs
 - The Spanish National Program of R+D+i has specific topics on Materials Science, Nanotechnologies, Energy and others well suited for the ICMS. The new instruments developed in the INGENIO2010 program constitute also good opportunities to promote excellence and integrated research at national level.
 - The VII Framework Program has also specific topics on: Nanosciences, nanotechnologies, materials and new production technologies; Energy; Transport and others into which the research of ICMS fit well.
 - Initiatives of the European Research Council, the European Science Foundation and the European Institute of Technology
- Regional environment
 - With regards to the goal of assuming a leading role in Materials Science in Andalusia, and of adapting to the local industrial environment, the new 'Plan Andaluz de Investigación' which encourages excellence research projects and cooperation with Andalusian industry, create very



interesting opportunities to turn the ICMS into the centre of reference in Materials Science research in Andalusia.

- University environment
 - The University of Seville is developing a new degree course in Materials Science, which is an opportunity for the ICMS to increase its presence in the educational activities of the University and to promote the recruitment of Fellows.
- Social impacts
 - The most important scientific and technological challenges are today related to research topics of high social impact. Environmental and energy, biomaterials or recycling, as well as multidisciplinary and innovative research have today good opportunities for funding attainment.
 - The ICMS is well positioned for contribution in the 'Energy and global change' strategic action as defined by the Governing Board of the CSIC
- New building and restructuring
 - The construction of a new building will lead to an extension of the actual useful space by a factor of 1.85. This is a great opportunity to solve the actual space problems.
 - In addition the new spaces will provide the required laboratories to restructure the Institute by incorporation of 8 permanent staff members coming from the Solid State Physics Department of the External Unit to the Cartuja's Centre. In this context a restructuring of the research units more adequate to the actual research lines is also proposed.
- Internationalization and Large Installation facilities
 - Participation in European initiatives like the Technological Platforms and the Joint Technological Initiatives (JTI).
 - Recruitment of young researchers from Europe, Sudamerica and Third countries can improve the mobility and integration of research.
 - Access to Synchrotrons and other large installation facilities.

RA (Relational Analysis)

Competitor groups

- Instituto de Ciencia de Materiales de Madrid (ICMM)

- **Institute:** Instituto de Ciencia de Materiales de Madrid (ICMM)
- **Institution:** Consejo Superior de Investigaciones Científicas (CSIC)
- **Address :** Cantoblanco, Cta. Colmenar km.15, 28049-Madrid, Spain
- **Web:** <http://www.icmm.csic.es/>
- **10 Recent articles:**
 1. Photonic glass: a novel random material for light.
García, P.D.; Sapienza, R; Blanco, A.; López, C.
Adv. Mater. 19, 2597-2602 (2007).
 2. Solar energy harvesting in photoelectrochemical solar cells .
Rodríguez, I.; Ramiro-Manzano, F.; Atienzar, P.; Martínez, J.M.; Meseguer, F.; García, H.; Corma, A.
J. Mater. Chem. 17, 3205-3209 (2007).
 3. Structural characterization of Ce_{1-x}Zr_xO₂ (0

- Instituto de Ciencia de Materiales de Aragón

- **Institute:** Instituto de Ciencia de Materiales de Aragón
- **Institution:** Consejo Superior de Investigaciones Científicas y Universidad de



Zaragoza

- **Address :** Universidad de Zaragoza (Pedro Cerbuna 12, 50009 ZARAGOZA-ESPAÑA
- **Web:** <http://www.unizar.es/icma/>
- **10 Recent articles:**

1. Resonant x-ray scattering study of layered TbBaCo₂O_{5.5}

Blasco J, Garcia J, Subias G, et al.

PHYSICAL REVIEW B Volume: 78 Issue: 5 Article Number: 054123, 2008

2. Minimal model for optical transmission through holey metal films

Martin-Moreno L, Garcia-Vidal FJ

JOURNAL OF PHYSICS-CONDENSED MATTER Volume: 20 Issue: 30 Article Number: 304214, 2008

3. Origin of the resonant x-ray scattering in LaMnO₃

Subias G, Herrero-Martin J, Garcia J, et al.

PHYSICAL REVIEW B Volume: 75 Issue: 23 Article Number: 235101, 2007

4. Porous crystal structures obtained from directionally solidified eutectic precursors

Larrea A, Orera VM

JOURNAL OF CRYSTAL GROWTH Volume: 300 Issue: 2 Pages: 387-393, 2007

5. Single-walled carbon nanotube-supported platinum nanoparticles as fuel cell electrocatalysts

Lafuente E, Munoz E, Benito AM, et al.

JOURNAL OF MATERIALS RESEARCH Volume: 21 Issue: 11 Pages: 2841-2846, 2006

7. Evolution of multiwalled carbon-nanotube/SiO₂ composites via laser treatment

Seeger T, de la Fuente G, Maser WK, et al.

NANOTECHNOLOGY Volume: 14 Issue: 2 Pages: 184-187, 2003

8. Effect of oxygen content on the Si-29 NMR, Raman spectra and oxide ion conductivity of the apatite series, La_{8+x}Sr_{2-x}(SiO₄)₆O_{2+x/2}

Orera A, Kendrick E, Apperley DC, et al.

DALTON TRANSACTIONS Issue: 39 Pages: 5296-5301, 2008

- Instituto de Catálisis y Petroleoquímica

- **Institute:** Instituto de Catálisis y Petroleoquímica
- **Institution:** CSIC
- **Address :** C/ Marie Curie 2, 28049-Madrid, Spain
- **Web:** <http://www.icp.csic.es/>
- **10 Recent articles:**

1. M.L. Cerrada, C. Serrano, M. Sánchez-Chaves, M. Fernández-García, F.

Fernández-Martín, A. de Andrés, R.J. Jiménez Rioboó, A. Kubacka, M. Ferrer and M. Fernández-García, Adv. Funct. Mater., 2008, 18, 1949.

2. J. Sá, M. Fernández-García and J.A. Anderson, Catal. Comm., 2008, 9, 1991.

3. Adán, C; Coronado, J.M.; Bellod, R; Soria, J; Yamaoka, H

Título: Photochemical and photocatalytic degradation of salicylic acid with hydrogen peroxide over TiO₂/SiO₂ fibres

Applied Catalysis A- General (2006) 303, 199 - 206

4. Aguadero, A.; Alonso, J.A.; Martínez-Lope, M. J.; Fernández-Díaz, M.T.; Escudero, M. J.; Daza, L.

In situ high temperature neutron powder diffraction study of oxygen-rich La₂NiO_{4+d} in



air: correlation with the electrical behaviour

Journal of Materials Chemistry (2006) 16, 3402 - 3408

5. Alessandri, I.; Bañares, M.A.; Ferroni, M.; Depero, L. E.; Foinasiero, P; Gennari, F. C.; Hickey, N.; Martínez-Huerta, M.V.; Montini, T.

Título: Structural investigation of Ce₂Zr₂O₈ after redox treatments which lead to low temperature reduction

Topic in Catalysis (2006) 41, 35 - 42

6. Barrio, L.; Liu, P.; Rodríguez, J.A.; Campos-Martín, J. M.; García-Fierro, J. L.

Título: A DFT Study of the Dissociation of H₂ on Gold Clusters: Importance of Fluxionality and Ensemble Effects

Journal of Chemical Physics (2006) 125, 164715 - 164720

8. Belver, C.; Bellod, R.; Fuerte, A.; Fernández-García, M.

Título: Nitrogen-containing TiO₂ photocatalysts. Part 1: Synthesis and Solid Characterization

Applied Catalysis B: Environmental (2006) 65, 301 - 308

9. Belver, C.; Bellod, R.; Steward, S.; Requejo, F.G.; Fernández-García, M.

Título: Nitrogen-containing TiO₂ photocatalysts. Part 2: Photocatalytic Behavior under Sunlight Excitation

Applied Catalysis B: Environmental (2006) 65, 309 - 314

Colaborator groups

- Materials Science Division

- **Institute:** Materials Science Division
- **Institution:** Lawrence Berkeley National Lab (LBL)
- **Address :** 1 Cyclotron Road, Berkeley CA94720. USA
- **Web:** <http://www.lbl.gov/msd/>
- **10 Recent articles:**

1. Electrooxidation of hydrogen on nanostructured Pt/C catalysts for polymer electrolyte fuel cells

Babic B, Radmilovic V, Krstajic N, et al.

RECENT DEVELOPMENTS IN ADVANCED MATERIALS AND PROCESSES Book Series: MATERIALS SCIENCE FORUM Volume: 518 Pages: 283-288, 2006

2. L. Fang, J.Y. Park, H. Ma, A.K.-Y. Jen, and M. Salmeron, "Atomic force microscopy study of the role of π - π stacking in molecular films with aromatic groups," Langmuir 23 (23), p.11522 (2007).

3. J. Germain, J.M.J. Frechet, and F. Svec, "Nanoporous Polymers for Hydrogen Storage," Polym. Mat., Sci. Eng. 97, 272-273 (2007).

4. F. J. Ribeiro, P. Tangney, S. G. Louie and M. L. Cohen, "Hypothetical Hard Structures of Carbon with Cubic Symmetry", Physical Review B 74 (17), 172101 (2006).

5. A. Cabot, V.F. Puentes, E.V. Schevchenko, Y. Yin, L. Balcells, M.A. Marcus, S.M. Hughes, and A.P. Alivisatos, " Vacancy Coalescence during Oxidation of Iron Nanoparticles," J. Am. Chem. Soc. 129 (34), p.10358 (2007).

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2. Photocatalytic decomposition of acetone using LaTi(O,N)(3) nanoparticles under visible light irradiation
Aguilar R, Kalytta A, Reller A, et al.
JOURNAL OF MATERIALS CHEMISTRY Volume: 18 Issue: 36 Pages: 4260-4265, 2008
3. Macroscopic control of plasma polymerization processes
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4. CaMn_{1-x}Nb_xO₃ (x

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THIN SOLID FILMS Volume: 516 Issue: 18 Pages: 6398-6401, 2008
4. Effect of the addition of Au in zirconia and ceria supported Pd catalysts for the direct synthesis of hydrogen peroxide
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5. Multifolded polymer solar cells on flexible substrates
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6. Self-assembly of fibers and nanorings from disulfide-linked helix-loop-helix polypeptides
Aili D, Tai FI, Enander K, et al.
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- **10 Recent articles:**

1. Resonant x-ray scattering study of layered TbBaCo₂O_{5.5}
Blasco J, Garcia J, Subias G, et al.
PHYSICAL REVIEW B Volume: 78 Issue: 5 Article Number: 054123, 2008
2. Minimal model for optical transmission through holey metal films
Martin-Moreno L, Garcia-Vidal FJ
JOURNAL OF PHYSICS-CONDENSED MATTER Volume: 20 Issue: 30 Article Number: 304214, 2008
3. Origin of the resonant x-ray scattering in LaMnO₃
Subias G, Herrero-Martin J, Garcia J, et al.
PHYSICAL REVIEW B Volume: 75 Issue: 23 Article Number: 235101, 2007
4. Porous crystal structures obtained from directionally solidified eutectic precursors
Larrea A, Orera VM
JOURNAL OF CRYSTAL GROWTH Volume: 300 Issue: 2 Pages: 387-393, 2007
5. Single-walled carbon nanotube-supported platinum nanoparticles as fuel cell electrocatalysts
Lafuente E, Munoz E, Benito AM, et al.
JOURNAL OF MATERIALS RESEARCH Volume: 21 Issue: 11 Pages: 2841-2846, 2006
7. Evolution of multiwalled carbon-nanotube/SiO₂ composites via laser treatment
Seeger T, de la Fuente G, Maser WK, et al.
NANOTECHNOLOGY Volume: 14 Issue: 2 Pages: 184-187, 2003
8. Effect of oxygen content on the Si-29 NMR, Raman spectra and oxide ion conductivity of the apatite series, La_{8+x}Sr_{2-x}(SiO₄)(₆)O_{2+x/2}
Orera A, Kendrick E, Apperley DC, et al.
DALTON TRANSACTIONS Issue: 39 Pages: 5296-5301, 2008

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 - **Institution:** Consejo Superior de Investigaciones Científicas (CSIC)
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1. Photonic glass: a novel random material for light.
García, P.D.; Sapienza, R; Blanco, A.; López, C.
Adv. Mater. 19, 2597-2602 (2007).
 2. Solar energy harvesting in photoelectrochemical solar cells .
Rodríguez, I.; Ramiro-Manzano, F.; Atienzar, P.; Martínez, J.M.; Meseguer, F.; Garcia, H.; Corma, A.
J. Mater. Chem. 17, 3205-3209 (2007).

3. Structural characterization of Ce_{1-x}Zr_xO₂ (0

Leading groups

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Hegemann D
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 4. CaMn_{1-x}Nb_xO₃ (x

- The Institute of Nanotechnology

- **Institute:** The Institute of Nanotechnology
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 - Jin, S.A.; Shim, J.H.; Cho, Y.W.; Yi, K.W.; Zabara, O.; Fichtner, M. Reversible hydrogen storage in LiBH₄-Al-LiH composite powder. Scripta Materialia, 58(2008) S.963-65; DOI:10.1016/j.scriptamat.2008.01.028
 - Busch, K.; Freymann, G.von; Linden, S.; Mingaleev, S.F.; Tkeshelashvili, L.; Wegener, M. Periodic nanostructures for photonics. Physics Reports, 444(2007) S.101-202; DOI:10.1016/j.physrep.2007.02.011
 - Chen, J.I.L.; Freymann, G.von; Kitaev, V.; Ozin, G.A. Effect of disorder on the optically amplified photocatalytic efficiency of titania inverse opals. Journal of the American Chemical Society, 129(2007) S.1196-1202; DOI:10.1021/ja066102s
 - Coste, S.; Bertrand, G.; Coddet, C.; Gaffet, E.; Hahn, H.; Sieger, H.

High-energy ball milling of Al₂O₃-TiO₂ powders. Journal of Alloys and Compounds, 434-435(2007) S.489-92; DOI:10.1016/j.jallcom.2006.08.117
--Fichtner, M. Preface to the viewpoint set: Nanoscale materials for hydrogen storage. Scripta Materialia, 56(2007) S.801-02; DOI:10.1016/j.scriptamat.2007.01.03
--Gliemann, H.; Almeida, A.T.; Freitas Siqueira Petri, D.; Schimmel, T. Nanostructure formation in polymer thin films influenced by humidity. Surface and Interface Analysis, 39(2007) S.1-8; DOI:10.1002/sia.2339
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--Akurati, K.K.; Bhattacharya, S.S.; Winterer, M.; Hahn, H. Synthesis, characterization and sintering of nanocrystalline titania powders produced by chemical vapour synthesis. Journal of Physics D, 39(2006) S.2248-54; DOI:10.1088/0022-3727/39/10/037
--Blanckenhagen, P.von From surface science to nanoscience. Surface and Interface Analysis, 38(2006) S.1103-05; DOI:10.1002/sia.2346

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4. Effect of the addition of Au in zirconia and ceria supported Pd catalysts for the direct synthesis of hydrogen peroxide
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5. Multifolded polymer solar cells on flexible substrates
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Aili D, Tai FI, Enander K, et al.
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**- Materials Science Division**

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- **Institution:** Lawrence Berkeley National Lab (LBL)
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1. Electrooxidation of hydrogen on nanostructured Pt/C catalysts for polymer electrolyte fuel cells

Babic B, Radmilovic V, Krstajic N, et al.

RECENT DEVELOPMENTS IN ADVANCED MATERIALS AND PROCESSES Book Series: MATERIALS SCIENCE FORUM Volume: 518 Pages: 283-288, 2006

2. L. Fang, J.Y. Park, H. Ma, A.K.-Y. Jen, and M. Salmeron, "Atomic force microscopy study of the role of π - π stacking in molecular films with aromatic groups," Langmuir 23 (23), p.11522 (2007).

3. J. Germain, J.M.J. Frechet, and F. Svec, "Nanoporous Polymers for Hydrogen Storage," Polym. Mat., Sci. Eng. 97, 272-273 (2007).

4. F. J. Ribeiro, P. Tangney, S. G. Louie and M. L. Cohen, "Hypothetical Hard Structures of Carbon with Cubic Symmetry", Physical Review B 74 (17), 172101 (2006).

5. A. Cabot, V.F. Puentes, E.V. Schevchenko, Y. Yin, L. Balcells, M.A. Marcus, S.M. Hughes, and A.P. Alivisatos, " Vacancy Coalescence during Oxidation of Iron Nanoparticles," J. Am. Chem. Soc. 129 (34), p.10358 (2007).

Selective Advantages

The Institute has a solid background in surface characterization, surface modification and surface reactivity of materials. In particular the Institute has a wide variety of very competitive plasma facilities for material synthesis and surface functionalization. Most of the PVD and CVD technologies for preparation of coatings and thin films are available with a strong tradition in the Institute. We are also specially well positioned in the fields of nanostructured coatings for mechanical , tribological and optical applications. A solid background in catalysis, surface functionalization and surface reactivity promotes the comprehensive understanding of both catalysts and catalytic devices. Such fields of expertise are unique in the Andalusian region.

Strong expertise in chemical synthesis procedures including sol-gel chemistry, colloidal chemistry, solvothermal synthesis and self-assembly oriented synthesis methods. Extensive experience in the fields of reactivity of solids, solid-state transformations, mechanochemistry and processing of ceramic materials. It is worth to mention the very well equipped mechanochemistry laboratory, the unique expertise on the biomimetic synthesis of SiC from vegetal precursors and the pioneering work in the chemical synthesis of nanoscopic and mesoscopic photonic structures.

Well established research objectives with a dilated research experience in excellent fitting with the transversal CSIC action in Energy and Global Climate Change. Recognised expertise in fields such as



catalysis and plasma processes for hydrogen production. Well suited for the study of catalytic and photo-catalytic processes for pollution abatement for both gas and liquid effluents and the study of ceramic matrix materials for the immobilization of radioactive wastes and sealing of repositories. Strong involvement in fields like hydrogen storage, CO₂ sequestration, ceramics of high oxygen/proton conductivity for solid oxide fuel cells (SOFC) and the enhancement of efficiency of solar cells.

Experienced researchers and technicians covering a wide range of general services. An extensive offer is at the disposal of the researchers in the Institute mastering most of the characterization techniques in following service departments: i) Spectroscopy Service (NMR, Raman, IR and UV-VIS spectroscopy); ii) Textural and Thermal Analysis Service (physic- and chemisorption analysis, thermal analysis, particle size analysis and porosimetry); iii) Electron Microscopy Service (TEM and SEM, as well as Energy Dispersive X-Ray (EDS) and Electron Energy Loss (EELS) spectroscopies and equipments dedicated to sample preparation); iv) X-ray Diffraction Laboratory (XRD and θ/θ in situ thermodiffraction); v) Surface Analysis Service (X-Ray Photoelectron Spectroscopy (XPS), and Glow Discharge Luminescence Spectroscopy (GDL)).

It is also worth to emphasize the strong experience of the Institute in the understanding of materials design by achievement of a detailed microstructural and chemical characterization (multitechnique approach). A natural evolution to more powerful techniques in the Nano-scale domain is being achieved specially in the electron microscopy service. Strong involvement of the Institute in the use of large installations like Synchrotron Radiation and Neutron beam Facilities.

The Institute has a strong network of links and relationships allowing the access to large installations, international funding programs and students and academic programs.

i) The ICMSE is a joint CSIC-US Institute, which enables an optimal involvement of their researchers in the University environment (recruitment of fellows, doctoral courses, masters, etc.), the Institute is also strongly involved in the new Degree on Materials Engineering offered by the University of Sevilla. ii) Strong connections to medium and large installation facilities particularly Synchrotron Radiation Facilities (ESRF, Diamond, ALBA, etc.), Rutherford Appleton Laboratory (UK), the Institute Laue Langevin of Grenoble (France). iii) A well established network of relationships with Latin American and European Universities and Institutions allowing the access to exchange of students and integrated programs of research.

Critical Analysis of Research Lines

- Tailored Nanomaterials and Microstructure
- **Status:** Consolidated
- **Justification:**-Actual permanent staff in the research line considering incorporation of 2 researchers from the Faculty of Physics: 3 researchers from the Univ. Sevilla and 3 researchers from the CSIC. It is the smallest research line regarding permanent staff personnel. The research line is a continuation of previous works in the Institute although is newly configured in its composition after re-structuring of the Institute. The line incorporate two permanent researchers from the Solid State Physics Department.
 - Strong and consolidated research line in the Institute. Good complementary combination of physicists, chemists and materials engineers to achieve multidisciplinary research. Well equipped team for Magnetron sputtering coating technology, gas phase condensation and chemical synthesis of nanoparticles. High level specialized team on TEM, HRTEM, EDX, EELS, AFM and XAS. High level tribology laboratory including: tribometer, scratch test, calo-text, profilometry. Regular access to synchrotron radiation facilities.
 - The team is very strong in the consecution of public funds specially European projects.
 - The line has several relevant research and development contracts with private companies. In the last two years two patents have been licenced to the Midatech Group Company.
 - The team has a regular and constant production of refereed scientific publications and technical production. Recognized expertise in several fields: Nanostructured coatings for

mechanical and protective applications, nanostructured hydride materials for hydrogen storage, functionalized nanoparticles with self-assembled monolayers and microstructural characterization in the nano-scale.

-The research topic of nanomaterials is too broad actually. The research line should concentrate its efforts in selected topics. A strong field is the one related to the correlation between microstructure and mechanical and tribological properties of nanostructured and nanocomposite coatings. The incorporation of the simulation studies should improve this topic strongly in the next period.

- Mechanochemistry and Reactivity of Materials

- **Status:** Consolidated

- **Justification:**-Actual permanent staff in the research line: 2 researchers from the Univ. Sevilla and 8 researchers from the CSIC. It is worth of mention that at the end of the period (2013), 5 members of the line will be more than 65 years old and some of them will likely retire. The research line is a continuation of previous works in the Institute although is newly configured in its composition after re-structuring of the Institute.

-Good and consolidated research line in the Institute. The research line has both senior experienced scientist with a large background and younger scientist starting their scientific career.

-Regarding mechanochemistry, the research line is one of the more relevant in Europe with one of the best equipped laboratory. One of the members of the group belongs to the board of the International Mechanochemistry association (an associate member of IUPAC) what support the international recognition of this unit in the field of mechanical alloying.

-The research developed by this unit in the field of thermal methods for the kinetic analysis of solid state reactions is also internationally recognised. Thus, members of the research line are pioneers in the development of the sample controlled thermal analysis methods. One of the members of this unit has served as editor and editorial board member of the two main journals devoted to Thermal Analysis (Thermochimica Acta and Journal of Thermal Analysis and Calorimetry). One of the components of the group is member of the advisory board of the journal Clay Minerals.

-Recognized experience in the application of the materials science background to the Cultural Heritage preservation. This task requires a multidisciplinary approach that has been acquired along the years.

-The team has a regular and constant production of refereed scientific publications.

-The research line has regular and constant income of funds from National and Regional Andalusia Research Programs. An important number of international bilateral projects are always running.

-Although the research line has a number of well established international cooperations improvements are expected in the consecution of European projects.

-An effort should be done in the research line to improve incomes from Industrial Programs.

- Nanostructured Functional Materials

- **Status:** Consolidated

- **Justification:**-Actual permanent staff in the research line: 2 researchers from the Univ. Sevilla and 7 researchers from the CSIC. The research line is a continuation of previous works in the Institute although is newly configured in its composition after re-structuring of the Institute.

-Very strong and consolidated research line in the Institute. Confluence in the line of scientists with expertise in all aspects of materials science, as required to address the proposed research in Nanostructured Functional Materials in an integrated way. The line manages several medium sized instruments for the synthesis and characterization of nanostructured materials, in the form of both thin films and nanoparticles, by different and complementary techniques. High specialization of the line in: PVD and CVD techniques for deposition of thin films, colloidal chemistry, XPS characterization, optical properties measurements and theoretical analysis of

the preparation processes and the simulation of optical properties. Most of the staff members of the line and PhD students regularly visit large international laboratories, in particular those ones equipped with synchrotron radiation sources.

-The line is very good in the consecution of public funding from competitive European Union Framework Programs, National Research Programs, and local Andalucian programs. The line participates in several large national and European projects in the areas of functional coatings (c.f., CONSOLIDER FUNCOAT Ref. CSD2008-00023), photovoltaics (CONSOLIDER HOPE ref. CSD 2007-00007), photonics (EU project PHODYE), and bioengineering (CIBER-BBN).

-The line has several relevant research and development contracts with private companies and Foundations. Good relationship of the line with some of the most relevant national industrial groups (Abengoa Group, Valeo Group, Cosentino, Indo, Cegasa, Torrecid, AIN?) and capability to transfer the acquired knowledge in basic research in thin film growth, plasma technology and solar cells in projects of interest for industry.

-Only in year 2008, six high impact factor journals have featured their materials in the cover store. The members of the line publish regularly refereed scientific papers in highly recognized international journals. Their recent developments in the synthesis and processing of luminescent rare-earth nanoparticles of controlled size and shape, organic luminescent thin films by plasma technologies and multifunctional photonic crystals for applications in the fields of sensing and photovoltaics are already having a great impact.

-The research line has very strong potential and recognized expertise in the fields of plasma assisted technology, optical properties, surface analysis and synchrotron characterization techniques. New topics like biomaterials will need collaborations with specialised laboratories and still lack from critical mass.

-An effort should be done by the research line to put into operation the general service on photoemission spectroscopies.

- Catalysis for environment and energy

- **Status:** Consolidated

- **Justification:**-Actual permanent staff in the research line: 5 researchers from the Univ.Sevilla and 4 researchers from the CSIC. It is worth of mention that during the 2010-2013 period one researcher from the line will retire. The research line is a continuation of previous works in the Institute although is newly configured in its composition after re-structuring of the Institute.

-Strong and consolidated research line in the Institute. A solid background in both catalysis and surface characterisation of materials allowing the study and comprehensive understanding of both catalysts and catalytic devices. Well established research objectives with a dilated research experience with excellent fitting to the transversal CSIC action in Energy and Global Climate Change.

-Experienced researchers mastering most of the characterization techniques with applications in catalysis, in particular a deep knowledge of UHV techniques and vibrational spectroscopy based analysis of materials.

-Strong expertise in chemical synthesis procedures including sol-gel chemistry, solvothermal synthesis and self-assembly oriented synthesis methods.

-The different staff members of this research line are worth of being continuously funded by National, Regional and Industrial Programs. The research team has solid relationship with industrial partners (Petrobrás, Brazil; BEFESA, Spain; Acerinox, Spain).

-The wide international relationships within Europe and Latin America provide a substantial number of Ph.D. students that are the key point for the advancement of the fundamental research. At this moment, people from Colombia, Germany, Bulgaria Italy and, of course, Spain are involved in this research line.

-The tradition of this research line has resulted in a wide availability of conventional equipments for catalysis and photocatalysis studies. This allows accomplishing most of the possible research projects. The staff members of the group have a wide selection of international relationships that allow completing most of the research instrumentation not accessible in their laboratories. In addition to this, large European facilities are continuously used having within

the staff people elected for the management of the large European and national large facilities as: ALBA, PSA and ESRF facilities. For some characterization techniques some staff members belongs to the reference panel of the catalytic community. Some staff members have been admitted as part of the IDECAT European network.

-Although the research line has a great number of well established international cooperations improvements are expected in the consecution of European projects.

-Oriented research towards the development of the catalytic materials associated to the catalytic processes will contribute to integration and collaboration of the research line with the other departments.

- Engineered Ceramics for Extreme Environments

- **Status:** Emergent

- **Justification:**-Actual permanent staff in the research line considering incorporation of 6 researchers from the Faculty of Physics: 9 researchers from the Univ.Sevilla and 2 researchers from the CSIC. This research line is a new emergent line that we incorporate in the next period by merging a group already existing in the ICMS and a new group incorporated from the Solid State Physic Department.

-The two research groups involved in this research line are internationally recognized and their expertises cover areas on material science critical for the achievement of the objectives proposed. Valuable critical mass to approach new strategies and research trends.

-Strong experience in the study of mechanical behaviour and microstructure in ceramics and the study of lamellar silicates and functional mesoporous materials. The research team is currently deeply involved in the development of high temperature protonic conductors, high temperature mechanical properties of eutectics ceramics, and ultra high temperature ceramics.

-The research team masters mechanical characterisation techniques which are unique in Spain and leading on an international scale (as flexural strength at high temperatures in small ceramic samples, creep in ceramics and composites). Unique expertise in the use of NMR spectroscopy and neutron facilities for the characterization of ceramic materials.

-The research line has the only laboratory in Spain devoted to the fabrication of biomimetic materials from vegetal precursors, being titular of 5 patents and the bioSiC® trademark, and is currently focused on the fabrication/design of biomimetic ceramics for specific applications based on SiC.

-Regular and constant income of funds from National Research Programs, partially from European Framework Programs and from regional Andalusian programs in which a high level of success is being achieved. The research line has been funded on the areas of high temperature protonic conductors and ultra high temperature ceramics by the European Office of Aerospace Research (Air Force, EE.UU.). This funding is a clear indication of the quality of research developed. Additionally several contracts and projects with Industrial partners demonstrate the applied interest of the research.

-Strong integration of the research line in the Institute is expected for the 2010-2013 period.

Critical Analysis of Services

- SPECTROSCOPY SERVICE

- **Status:** Consolidated

- **Justification:**-The Spectroscopy Service can be considered as a complementary powerful tool necessary for the development of material science project. In particular, such techniques allow to obtain important electronic and structural information for materials (both films and powdered materials) developed by several groups in our institute. The creation of the Spectroscopy

Service that join the IR, Uv-vis and NMR services will help the development, organization and improvement of the facilities offered to the internal and potential external users. In this sense, the Service has been recently implemented by a new unit dedicated to RAMAN spectroscopy with some specific accessories.

-The opportunities arise from the existence of recognized and experienced groups in all the spectroscopic techniques that the service offers.

-Actions must be done to solve the deficiencies in the high pressure air facilities of CICIC to allow the installation of new equipment for the NMR facilities. In particular the installation of a new three channels probe should be achieved soon.

-It is necessary to acquire a new infrared spectrometer to maintain the use of this technique and the agreements and contracts with different companies and institutions, which suppose interesting income for the Institute. Also a new UV-VIS spectrometer is necessary with an accessory for powdered samples. These acquisitions have been included in the proposed plan of the Institute.

- Textural and Thermal Analysis Service

- **Status:** Consolidated

- **Justification:**-This Service is a basic tool necessary for the development of all kind of powder materials in the Institute. The service is specially suited for the catalysis and ceramic materials groups. The textural service present high rate of use since it is a basic tool for most of the groups in our Institute. This can be stated in the rate of use data reported. In addition it presents low maintenance costs. This fact makes this service highly efficient and convenient for the Institute. Also the thermal analysis measurements have a high demand between scientists of our Institute. The instruments does not require a big investment in maintenance.

-Regarding to textural services, a great opportunity would consist on the implementation of the service with additional equipments for routine physi-sorption measurements. Such reinforcement will allow increasing the number of time demanding measurements (chemisorption and microporosity). In the action plan on equipment it is planned the acquisition of routine physisorption equipment.

-In the case of the thermal analysis equipment, the recent (2008) acquisition of a new simultaneous TD-DTA instrument to replace the old one, that was dismantled almost two years ago, and of a new DSC opens new possibilities for the institute researches.

- Electron Microscopy Service

- **Status:** Consolidated

- **Justification:**-The main strength of the service is the large experience demonstrated by the technical personnel ascribed to the service, both in the use of transmission electron microscopy and scanning electron microscopy techniques, as well and in the application of the different available techniques to support the scientific staff to solve a great variety of problems. The experience of the technicians is also of great importance in those cases in which a sample preparation is needed prior to their study.

-The increasing interaction with the groups involved in different research projects, the satisfaction with the results and their increasing interest in the possibilities of the different techniques are all a motivation to develop the service during the next future.

-The main weakness of the electron microscopy service is the obsolete situation of the transmission electron microscopes (they are ten and eighteen years old respectively), and the spectroscopic techniques attached to them. The EDS detector attached to the old scanning electron microscope is also not properly working. This obsolete situation of the transmission electron microscopes limits also the possibilities of access to the more advanced electron microscopy techniques such as STEM, HAADF, Energy Resolve Spectroscopies, etc? that could be very helpful for the highly demanded research projects carried out at the institute. Lack of in place ion milling facilities is another problem of the service. Actions have been planed to the acquisition of new updated equipments for the 2010-2013 periods.

-A great opportunity of the service is the increasing interest of the scientific community in studying materials at the nanoscale. The development of research projects in the centre in the context of the Nanoscience and Nanotechnology could be a chance for the acquisition of new and more advanced scientific equipment in the field of electron microscopy to manipulate the matter at the nanoscale (nano-manufacturing) and to characterize the systems using electron probes with size in the range of few angstroms. Great effort is pretended to be done with the support of some other research centres or universities at the Andalusian region, which have also similar research interest or expertise personnel in the field of electron microscopy techniques, in order to the establishment of a singular installation for electron microscopy studies.

- X-ray diffraction laboratory
- **Status:** Consolidated
- **Justification:**-The different analytical techniques offered by this service are useful to carry out the research projects of the different groups integrated in the ICMSE. This service is also a basic tool necessary for the studies of the synthesis and characterisation development in the Institute and also for the study in the area of Cultural Heritage materials. The service has technical personnel and scientific staff specialised in the techniques it offers
- The obsolete situation of some of the equipment and the lack of modern and specialised accessories needs to be solved. In the acquisition plan for new equipments it is planned to substitute one of the XRD general equipment with the possibility of including capabilities for polar plots and texture analysis.
- For the future it is planned to incorporate new instrumentation able to study textural and structural properties and also small angle x-ray scattering.

- Surface Analysis Service
- **Status:** Emergent
- **Justification:**-The creation of the surface analysis service is based on the strong tradition and scientific level of the researchers of the Institute in surface analysis techniques. Specially Photoemission spectroscopy (XPS) is a key topic of the Institute since its creation and has been applied to the study of catalytic materials, coatings, surface functionalization, steels, etc.
- The Institute has invested since its creation in the acquisition of surface analysis techniques, specially photoemission equipments. It is necessary however to incorporate this equipments to the service scheme of the Institute. Easy access routines and support to users should be available. A technician will be incorporated immediately (end of 2008) to avoid dependence of the service on the scientific staff personnel. The up-date of obsolete electronics is necessary to put into service the actual equipments.
- Due to the top level expertise of the Institute staff in these techniques , it is expected that the service become a reference facility for surface analysis at the regional and national level.

- Servicio de Diseño Mecánico y Electrónico
- **Status:** Consolidated
- **Justification:**-The service offers a great variety of possibilities by combining design and fabrication options with the integration of mechanical and electronic capabilities. The realisation of prototypes, small pieces and equipment, "in situ" repair of components and many other advantages put the Institute in a very good position for developing more ambitious and demanding projects.
- The future development of the service should be accompanied of improvements in space, personnel and new infrastructures. Of special importance is the recruitment of qualified personnel in electronics for equipment maintenance and development. Very recently our electronic technician moves to another position in the CSIC and we are seeking for replacement personnel



- Apoyo a Dirección y Secretaría
- **Status:** Consolidated
- **Justification:** -It is worth of mention that the Materials Science Institute of Sevilla is integrated in the Scientific Research Centre ?Isla de la Cartuja? (CICIC). This centre provides centralized services including: Administration, a general manager, IT service, library, stores and maintenance.
 - The Institute service is constituted by a small team that supports de Director of the Institute and carry out management and secretary activities for the Institute in the following items: Director secretary, Institute secretary, management of invoices from researchers to the CICIC, inventory, management of the ordinary budget, management of conferences and post-graduate courses, management of workshops organization, courier and mail management, photocopy service, telephony, web page, data base and files, reports, spreading of knowledge to general public, health and security items, etc.
 - Very valuable team that helps strongly the activity of the Director regarding management, spreading of knowledge and helalth and security.

General Objectives

General Objectives,Goals?

The ICMS is an interdisciplinary research and services public institution covering selected fields of materials science and technology development including important environmental aspects.

The ICMS research and development activities are oriented to meeting the requirements of industry and the needs of our society, and link together applications-oriented research to develop new materials, mainly of inorganic composition, with desired structure, properties, and behaviour.

The ICMS goal is also to become the leading centre of reference in materials science research and technical assistance for materials characterization in the ?Comunidad Autónoma de Andalucía?. This will enable the transfer of knowledge, innovative and superior processes, and the most-advanced techniques to the scientific community and the industrial network of the region, helping the CSIC to reinforce its links with the regional government and universities. The internationalization of the scientific activity of the Institute will also contribute to improving the position of the ICMS as a centre of reference in the region.

The research and development activities are oriented to meeting the requirements of industry and the needs of our society and objectives may be therefore achieved in following tasks: Execution of research, dissemination of knowledge, technology and know-how transfer to industry, education and training, integration and internationalization, services and technological support to companies and social benefits including gender, health and quality issues.

The selected topics of research in the Institute have been organized into five research lines that also correspond to planned research units or departments. It is therefore the main objective of the ICMS to carry out R+D activities in the following items:

- Tailored Nanomaterials and Microstructure
- Mechanochemistry and Reactivity of Materials
- Nanostructured materials for functional properties and applications
- Catalysis for environment and energy
- Engineered Ceramics for Extreme Enviroments



Integration among the research lines is a main objective in this strategic plan to improve our capabilities to participate in large and more challenging projects.

A strong improvement in the number of Doctoral Thesis is proposed. In comparison to the 2003-2007 period we propose an increase of 50% in the number of Thesis for the 2010-2013 period.

At this point it is important to emphasize that the research lines and research groups seek for their own financial support. The actual uncertainty in the availability of research funds makes the researchers to be less ambitious in their objectives for funds capture and consecution of research projects. The review and negotiation process with the managers of the CSIC may give us indications to the level of risk we should undertake.

The attached document in the "General Strategy Section" includes the quantitative objectives that were proposed and approved for the 2005-2009 period for the ICMS. For the next 2010-2013 period an improvement is proposed starting from these values as discussed in the concrete objective sections.

Scientific objectives

- The total number of permanent researchers (from CSIC & Univ. Seville) has been calculated in the previous evaluation of productivity (2005-2009) considering that the scientific production of the University professors may be corrected by a factor of 0.6 (due to the time they dedicate to teaching activities). Using this factor the actual number of permanent researchers for the ICMS at the beginning of 2010 (taking into consideration the incorporations from the Physics Faculty, the incorporation from new positions and the retirements in 2009) will be 38.6 (resulting from 21 permanent University staff and 26 permanent CSIC staff). This value is giving a medium size Institute in the complete profile of the Materials Science Area of the CSIC. The scientific production and objectives of the Institute should be analyzed for comparison purposes considering this medium size.
- The Institute proposes a strong improvement in the production of articles in SCI refereed journals seeking for improvement of the impact factor as the main goal. To achieve regular publication in top most Journals is our goal for the next period. The starting point will be to produce 102 SCI articles in 2010, this corresponds to 2.6 articles per permanent researcher (considering 38.6 actual number of researchers). An increase of 20% production is expected at the end of the period.
- Regarding consecution of financial support from competitive programs it is important to emphasize that the research lines and research groups seek for their own financial support. The actual uncertainty in the availability of research funds makes the researchers to be less ambitious in their objectives for funds capture and consecution of research projects. The review and negotiation process with the managers of the CSIC may give us indications to the level of risk we should undertake. For the 2010-2013 period the Institute proposes an increase in capture of funds in competitive programs of 25% starting from a value of 51.8 kEuros per permanent researcher for the year 2010 (considering 38.6 actual number of researchers).
- Although the level of success in the consecution of regional projects is very high for the ICMS, our goal is to improve this rate in the consecution of National and European projects.
- In addition to publications in refereed journals, the increase in the scientific visibility of the Institute will be prosecuted by active participation in the most important Conferences in the characteristics topics of the five research lines.

IN THE GENERAL STRATEGY SECTION AN ANNEX IS INCLUDED SUMMARIZING THE QUANTITATIVE OBJECTIVES PREVIOUSLY PROPOSED AND APPROVED FOR THE 2005-2009 PERIOD FOR THE ICMS.

Knowledge Transfer objectives



-All the research lines of the Institute have proposed to improve their technology transfer activities. In general the research objectives are analysed and discussed for having industrial potential and new research topics driven by applications are being designed in all the research lines.

-A special effort will be also done to protect applicable research results before publication. Strong participation of the research lines in the 'To patent & To publish' program of the Technology Transfer Office of the CSIC is foreseen. Three requested priority patents are expected to be presented each year. Our objective is also to licence at least one patent per year.

-Although collaboration with companies and industrial partners have increased in the last years it is still necessary to improve this activity in the framework of R&D contracts and through the collaboration programs established by the Ministry. The proposed objectives are for the moment not very ambitious.

IN THE GENERAL STRATEGY SECTION AN ANNEX IS INCLUDED SUMMARIZING THE QUANTITATIVE OBJECTIVES PREVIOUSLY PROPOSED AND APROVED FOR THE 2005-2009 PERIOD FOR THE ICMS.

Training objectives

-The strong academic implication of the researchers of the Institute in the programmes of the University of Sevilla ensures the access to Physics, Chemistry and Materials Engineering students including undergraduate degree projects and Ph.D students. In addition to this, most of the researchers are involved in teaching in the Materials Science master degree of the University of Seville. All this activity will allow to maintain a continuous flow of Ph.D. students and to increase the number of degree projects performed in the Institute. The Institute also organizes courses of the post-graduate training program of the CSIC. Particularly on characterization of thin films and surfaces, application of Synchrotron radiation techniques to the characterization of materials and NMR spectroscopy analysis. It is therefore foreseen objectives of more than 400 hours teaching in masters and post-graduate courses for each year of the next 2010-2013 period.

-A strong improvement in the number of Doctoral Thesis is proposed. In comparison to the 2003-2007 period we propose an increase of 50% in the number of Thesis for the 2010-2013 period.

-Supported activities and facilities will be enabled for promoting the integration of research and education in a number of significant ways: contributing to the education and training of numerous undergraduate, graduate students postdoc as well as visitors from many companies and universities.

IN THE GENERAL STRATEGY SECTION AN ANNEX IS INCLUDED SUMMARIZING THE QUANTITATIVE OBJECTIVES PREVIOUSLY PROPOSED AND APROVED FOR THE 2005-2009 PERIOD FOR THE ICMS.

Outreach objectives

-Continuous participation in the Sevilla Fair of Science, Open Doors days and demonstration activities for the Secondary School students

-Continuous up-dating of our web-site to enable a general knowledge of the activities and main achievements of the Institute

NEW PARAMETER IN THIS STRATEGIC PLAN

Internationalisation objectives

-One important objective will be to consolidate already existing or to develop more international research collaborations with complementary or synergetic research groups particularly to promote multidisciplinary research. The participation in bilateral actions, the ERIC network and international



programs as CYTED and FPVII will provide opportunities to maintain and/or increase the internationalization of the Institute. The objective of the Institute is to have at least two international collaborative projects approved each year for each research line.

-Continuous recruitment of PhD students and post-doctoral young researchers coming from Europe and other countries. The objective of the Institute is to have at least two foreign researchers (PhD or Post-doc) per year per research line.

-As a result of the international dimension of the Institute we expect to have at least 20% of our publications with co-authors from other Institutions in the world.

-All the scientific general services of the Institute can attend users in English.

NEW PARAMETER IN THIS STRATEGIC PLAN

Common services objectives

-Following general services have been identified and evaluated regarding costs, service units, possible self-financing, etc.:

- a) Spectroscopy Service
- b) Textural and Thermal Analysis Service
- c) Electron Microscopy Service
- d) X-ray diffraction laboratory
- e) Surface Analysis Service
- f) Mechanical and electronic workshops

-The actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very short or even gratis in many equipments. In the next period efforts will be done in the general services to become more self-financing. A certain degree of self-financing is proposed with an objective of ca. 8-10% of the total costs including personnel costs.

-It is also intended as an objective to maintain the efficiency of our services at least in the level they are in the present moment. Due to the antiquity of some of the equipments our goal is on one side just to maintain and renovate equipment to keep our capabilities. On the other hand we expect to be at state of the arte level in the Analytical High Resolution Electron Microscopy technology.

-A high degree of electronic management of our services is proposed as an objective in the 2010-2013 period.

NEW PARAMETER IN THIS STRATEGIC PLAN

Gender equality objectives

-Objectives for establishing equal opportunities

Establishing equal gender opportunities in research, management and administration is one of the strategic objectives of the Institute. The members of the Institute will be appointed on a purely meritocratic basis. The researchers selected to work on the ICMS are qualified in the field. No selection of members will be made on the basis of gender or ethnic issues. Applications for posts are and will continue to be evaluated on the basis of the length of time potential researchers have spent in scientific employment since graduation. This ensures that applicants who have taken career breaks for child- or family-care purposes are not discriminated.

-Objectives to improve work / life balance

The compatibility of leisure time, family and job has a high priority for both female and male staff. For a better compatibility of professional and private life, our Institutions allow part-time and flexitime arrangements for any researcher who is helping to bring up children or who is caring for other family members. Our Institute encourages the help given by the Organizations to facilitate nursery places for the children of researchers.

-Quantitative level. The 40% target of women researchers participation was set by the EU Commission as the ?wish? achievement for all projects, running under the FP6. In our Institute 34



(75.5%) permanent researchers are male and 11 (24.5%) are female. To overcome this low numbers emphasis should be placed in the Institute on the development and training of young female researchers with the wider aim of encouraging them to pursue scientific career options. This means that there is and will continue to be a concerted effort to make opportunities available to female young researchers.

NEW PARAMETER IN THIS STRATEGIC PLAN

Quality programmes objectives

At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

NEW PARAMETER IN THIS STRATEGIC PLAN

General Strategy

Summary

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--In the present strategic plan a new structure is proposed based in the creation of five research lines associated to new Departments or Research Units. The proposed reorganization is based on the integration of 8 researchers from the external unit, with Solid State Physic background, in the Cartuja Centre. This new structure constitutes the main strategy presented in this Plan and aims to improve the connexion between Solid State physicists and chemists and to improve the integration of the personnel from the University of Seville and the CSIC in the joint Institute. This strategy will favours the integration and the achievement of critical mass for approaching more challenged research projects. In fact the actual number of permanent scientific personnel in the ICMS-Cartuja is 38 people mainly with a Chemistry degree (only 3 are physicists and one has both degrees). The incorporation of 8 researchers with Physics degree coming from the External Unit, constitutes a very valuable and multidisciplinary team.

--The Road Map for the re-organization of the Institute

-The starting of the new strategic plan in 2010 will coincide with the kick off of the new organizational chart with new Departments (or Research units). In this moment the new incorporated researchers will participate in the evaluation of the productivity by fulfilment of objectives.

-The proposal of the new structure will also be submitted to the CSIC-US joint Committee for review and approval. The actual agreements may also be renovated and actualized according to the new legal structure of the CSIC as an Agency and due to the new regulations of the Sevilla University. The revision of the agreements should contribute to go further in the capacities and flexibility of the joint centre. All along the year 2009 work should be done to review the internal regalement of the joint Institute with regulation of the new Departments, clarification of the external unit status and regulations for the assignment of personnel to the Institute.

-In July 2009 the procedure for the renovation of the Institute Direction team will start finishing in October 2009. In January 2010 the new structure should be put into operation with the election of a new Governing Board.

--Strategies on methodologies and know-how.



The Institute has a good background and expertise on the synthesis and microstructural characterization of materials, especially in nanomaterials, catalysts, ceramics and thin films and coatings. In the next period new capabilities and methodologies will be developed and/or incorporated in two directions:

- i) Improvement of the evaluation of properties of materials. The main activity will be focussed on catalytic activity properties, optical properties and mechanical, tribological and thermal resistance behaviour.
- ii) Simulation and modelling of materials also specifically related to mechanical, optical and catalytic behaviour of surfaces, bulk materials and coatings.

The improvement of our capabilities in the evaluation and simulation of materials properties focussed on well identified topics will be a very valuable strategy in the next period.

--A key point of the present strategic plan is also to improve the capacities of the Institute to establish collaborations and integration among the different research lines. A main objective is to improve our capacities to participate in large projects by establishing strong collaborations among the research lines. Atomization of the research groups should be avoided in the next period 2010-2013.

In a natural evolution the research lines on "Tailored Nanomaterials and Microstructure" and "Nanostructured Functional Materials" should interconnect strongly and both lines have recently achieved the joint participation in a CONSOLIDER project recently approved. In the same strategy the research line on "Mechanochemistry and Reactivity of Materials" will have strong connections with the groups involved in both the "Tailored Nanomaterials and Microstructure" and "Engineered Ceramics for Extreme Conditions" lines regarding the development of materials (both bulk and coatings) with improved mechanical behaviour. The integration of that research line (Mechanochemistry and Reactivity of Materials) with the new incorporated line on "Engineered Ceramics for Extreme Conditions" will be also very strong in the field of new ceramic materials for ultra high temperature applications, as they have complimentary experties on the field of processing and high temperature mechanical properties. These two research lines already have a well established collaboration in the field of high temperature protonic conductors in which their complementarity have shown to be very succesful in the development of new materials.

The research line ?Catalysis for Environment and Energy? although is one of the oldest research topic at ICMS start now with this new formulation. Essentially, the research line is the result of merging the entire catalytic research already done at the ICMSE in one line. Cooperation and integration is already a fact with the other research lines and will be improved in the future for the development of new materials regarding both supports and catalytic active phases. Plasma activated processes, microstructural characterization in the nanoscale are among others examples of this integrated research.

In addition to that the general services laboratories of the ICMS provide a set of well organized characterization facilities that gives rise to economy in the personnel by hiring specialised technicians and improving the efficiency of scientists work planning for all the research lines. Also a special activity will be developed at the general characterization services for the study of Cultural Heritage materials what constitutes a research and service topic of strong tradition in the Institute.

--Strategy on funding search and financial support.

At this point it is important to emphasize that the research lines and research groups seek for their own financial support. This leads in some cases to atomization of the groups and dispersity of the research. The strategic plan aims to promote integrated research focussed on the identified main resarch lines and objectives. The own resorces of the Institute like personnel and equipment will be focussed in the next period to potentiate the identified main resarch lines and objectives.

- i) On one side the research lines will seek for financial support through applications for projects at the different available calls at national, regional and European level:

-The Spanish National Program of R+D+i has specific topics on Materials Science, Nanotechnologies, Energy and others well suited for the ICMS. The new instruments developed in the INGENIO2010 program constitute also good opportunities to promote excellence and integrated research at national level.



-The VII Framework Program has also specific topics on: Nanosciences, nanotechnologies, materials and new production technologies; Energy; Transport and others into which the research of ICMS fit well.

-Initiatives of the European Research Council, the European Science Foundation and the European Institute of Technology

ii) On the other side the Institute will dedicate funds received from the EQUIPA program of the CSIC as co-financial support for applications at the national and regional infrastructure programmes. In any case the priority of equipment acquisition corresponds to the priority defined by the general services starting from substitution and keeping into operation the more basic resources. Special actions will be directed to the consequence of up-to-date facilities in HRTEM and XPS. In a second stage also equipment for the research lines is foreseen. The Institute expect to get at least 50 % of their financial support for infrastructures from competitive sources.

--Strategy on Human resources distribution and recruitment policy.

The demand of the research lines regarding personnel incorporation is higher than the expected resources to be received. On the other hand all the five research lines have been proposed to be maintained as necessary for the future evolution of the Institute. By this reason an strategy is proposed for the distribution of human resources based on the expected achievement of a minimum distribution of personnel among all the research lines. The lines will also compete for resources according to objectives proposed, previous achievements and qualification and expertise of candidates seeking for the incorporation of the most qualified scientist matching the profiles of the research lines of the Institute. The dispersion and atomization of the research objectives tends to be avoided in this stage keeping the incorporation program to the research objectives presented in this strategic plan.

--The proposed strategy for the general services is described for each particular service in the corresponding section. As a general strategy we intend at least to maintain operative the techniques we already have. In addition to that the general services will intend to be more self-financing. Nevertheless the actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very low or even gratis in many equipments.

--It is expected that qualification and expertise of the administration at the Cartuja's centre will be improved in the next years. This strategy should facilitate the management of large projects to avoid overloading of researchers with administrative work.

--The attached document included quantitative objectives that were proposed and approved for the 2005-2009 period for the ICMS. For the next 2010-2013 period an improvement is proposed starting from these values as discussed in the objectives section.

Strategy Analysis

In the next paragraphs it is intended to explain how some of the proposed actions in the above presented general strategy will benefit the Institute activity.

-The proposed re-organization of the Institute research lines is a long term necessity and has been proposed with two aims: a) To achieve critical mass and homogeneity in the research objectives and b) to integrate researchers specialized in Solid State Physics from the external unit.

-The improvement of cooperation between research lines is intended to achieve critical mass for ambitious projects and to avoid atomization. All the received resources in personnel and equipment should go to identified research lines and objectives and to the general services.



-Our services work at the present moment as a support for the researchers and research lines. The prices for the use of our services is very low and even gratis in some cases. Although some improvements are expected in self-financing of our services our aim is to keep them mainly as for the research projects.

-All measurements to facilitate management of projects are welcome. European and large projects are very much time consuming. The activation of the administrative general department in the Cartuja's Centre (CICIC) is a continuous claim of the Institute. It is necessary a more strong involvement of our administration in the managements of European projects.

-Actions related to potentiate the mechanical and electronic Workshops are crucial to the well functioning of the Institute. It is absolutely necessary to improve our capacities in maintenance and repair of the scientific equipment.

Outreach

-Continuous participation in the Sevilla Fair of Science, Open Doors days and demonstration activities for the Secondary School students

-Continuous up-dating of our web-site to enable a general knowledge of the activities and main achievements of the Institute

Internationalisation

-One important strategy will be to consolidate already existing or to develop more international research collaborations with complementary or synergetic research groups particularly to promote multidisciplinary research. The participation in bilateral actions, the ERIC network and international programs as CYTED and FPVII will provide opportunities to maintain and/or increase the internationalization of the Institute. The strategy will be to apply first for a bilateral action and after the collaboration have been established try to go to a large European project.

-Continuous recruitment of PhD students and post-doctoral young researchers coming from Europe and other countries. The strategy is to make the Institute attractive to young researchers. Integration of foreign young researcher is very good in our Institute. Also Erasmus students will be received through the University teaching programs.

-As a result of the international dimension of the Institute we expect to have at least 20% of our publications with co-authors from other Institutions in the world.

-All the scientific general services of the Institute can attend users in English.

Quality Control Programmes

At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

Gender Equality

-Objectives for establishing equal opportunities

Establishing equal gender opportunities in research, management and administration is one of the

strategic objectives of the Institute. The members of the Institute will be appointed on a purely meritocratic basis. The researchers selected to work on the ICMS are qualified in the field. No selection of members will be made on the basis of gender or ethnic issues. Applications for posts are and will continue to be evaluated on the basis of the length of time potential researchers have spent in scientific employment since graduation. This ensures that applicants who have taken career breaks for child- or family-care purposes are not discriminated.

-Objectives to improve work / life balance

The compatibility of leisure time, family and job has a high priority for both female and male staff. For a better compatibility of professional and private life, our Institutions allow part-time and flexitime arrangements for any researcher who is helping to bring up children or who is caring for other family members. Our Institute encourages the help given by the Organizations to facilitate nursery places for the children of researchers.

-Quantitative level. The 40% target of women researchers participation was set by the EU Commission as the ?wish? achievement for all projects, running under the FP6. In our Institute 34 (75.5%) permanent researchers are male and 11 (24.5%) are female. To overcome this low numbers emphasis should be placed in the Institute on the development and training of young female researchers with the wider aim of encouraging them to pursue scientific career options. This means that there is and will continue to be a concerted effort to make opportunities available to female young researchers.

Knowledge Transfer

-All the research lines of the Institute have proposed to improve their technology transfer activities. In general the research objectives are analysed and discussed for having industrial potential and new research topics driven by applications are being designed in all the research lines.

-Although collaboration with companies and industrial partners have increased in the last years it is still necessary to improve this activity in the framework of R&D contracts and through the collaboration programs established by the Ministry.

-A special effort will be also done to protect applicable research results before publication. Strong participation of the research lines in the ?To patent & To publish? program of the Technology Transfer Office of the CSIC is foreseen.

-The protection of knowledge and results will be addressed by adopting appropriate agreements where the intellectual property is well preserved. i.e. to produce a business model and exploitation strategy; technology transfer actions, patent filling etc. IPR rules will be described properly in any agreement based on the EC recommendations for the collaborative projects.

-A great opportunity of the Institute is the increasing interest of the scientific community in studying materials at the nanoscale. The development of research projects in the Institute in the context of Nanotechnological applications has attracted the attention of the Regional Ministry of Innovation, Science and Industry. In particular a Workshop has been organized by the Regional Ministry and the Institute in November 2008 to generate a discussion forum between researchers and companies. Support will be given by specialised personnel in technology transfer activities to promote companies incubators, licencing of patents and technology transfer activities.

Strategy on Research Lines

Global actions

- Tailored Nanomaterials and Microstructure
- **Action to execute:** maintain **Priority:** 1
- **Justification:** According to previous results and proposed objectives, this research line has

received priority 1. Several actions are intended for this research line in the aim to overcome weaknesses and threats:

- The incorporation of new young researchers (Tenured scientist, Post-doc and Pre-doc) is crucial to achieve a critical mass that allow new strategies and research trends.
- The incorporation of technicians for the research line is expected. This will greatly improve the scientific capabilities of the line, through both helping to carry out the research projects with industries and operating and performing maintenance of large equipments.
- A main weakness is the lack of micro- nano-hardness measurements facilities. Application for funds in competitive calls for infrastructure will be carried out regarding nanoindentation/lateral force microscopy. Additionally the research line is highly dependent of the electron microscopy facilities. The action implemented to update and renovate the electron microscopy service will be also very beneficial for this research line.
- Laboratories and offices are fully overloaded. The growth of the line (both in personnel and equipment) in the last years and the incorporation of researchers from the Physics Faculty has saturated the available space and the use of facilities. The construction of the new building is of fundamental importance to overcome this problem. This research line has a strong improvement in space in the planed distribution of the new labs.

- Mechanochemistry and Reactivity of Materials

- **Action to execute:** maintain **Priority:** 2

- **Justification:**According to previous results and proposed objectives, this research line has received priority 2. Several actions are intended for this research line in the aim to overcome weaknesses and threats:
- At the end of the period (2013), 5 members of this research line will be more than 65 years old and some of them will likely retire. The incorporation of new young researchers (JAE senior, Post-doc and Pre-doc) is crucial to successfully achieve the foreseen objectives in this research line.
 - The research line has a strong tradition in the the characterization and evaluation of materials from ?Cultural Heritage?. The incorporation of technician in the general services will contribute to maintain this activity because the retirement of personnel in the near future will strongly reduce the personnel in this topic.
 - A main weakness is the lack of equipment for physical and mechanical properties measurement. Application for funds in competitive calls for infrastructure will be carried out regarding a high temperature dilatometer and a gas chromatograph coupled to Mass Spectrometer. Additionally the research line is highly dependent of the electron microscopy facilities. The action implemented to update and renovate the electron microscopy service will be also very beneficial for this research line.
 - Laboratories and offices are fully overloaded. The construction of the new building is of fundamental importance to overcome this problem. This research line has a strong improvement in space in the planed distribution of the new labs.

- Nanostructured Functional Materials

- **Action to execute:** maintain **Priority:** 1

- **Justification:**According to previous results and proposed objectives, this research line has received priority 1. Several actions are intended for this research line in the aim to overcome weaknesses and threats:
- The incorporation of new young researchers (Tenured scientist, Post-doc and Pre-doc) is crucial to successfully achieve the foreseen objectives. The incorporation of Material Engineers, Electrical Engineers and Biomaterial Engineers is of utmost importance.
 - The incorporation of technicians for the research line is expected. This will greatly improve the scientific capabilities of the line, through both helping to carry out the research projects with industries and operating and performing maintenance of large equipments.

- A main weakness is the lack of specialized optical characterization equipment. Application for funds in competitive calls for infrastructure will be carried out regarding the acquisition of equipment for the life time measurement of excited states.

-Laboratories and offices are fully overloaded. The fast growth of the line (both in personnel and equipment) in the last years has saturated the available space and the use of facilities. The construction of the new building is of fundamental importance to overcome this problem. This research line has a very strong improvement in space in the planed distribution of the new labs.

- Catalysis for environment and energy

- **Action to execute:** maintain **Priority:** 1

- **Justification:**According to previous results and proposed objectives, this research line has received priority 1. Several actions are intended for this research line in the aim to overcome weaknesses and threats:

-The incorporation of new young researchers (Tenured scientist, Post-doc and Pre-doc) is crucial to successfully achieve the foreseen objectives. The incorporation of Mechanical and Chemical Engineers is of utmost importance.

- The incorporation of technicians for the research line is expected. Routine tasks and support activities for industrial programs will be undertaken by this personnel what will improve efficiency of both the industrial programs and the fundamental studies.

- A main weakness is the lack of specialized UHV analytical techniques. Application for funds in competitive calls for infrastructure will be carried out regarding the acquisition of an XPS machine mainly suited for catalysis studies. This capability should be covered by the new general service facility or specifically by acquisitions associated to this research line.

-Laboratories and offices are fully overloaded. The fast growth of the line (both in personnel and equipment) in the last years has saturated the available space and the use of facilities. The construction of the new building is of fundamental importance to overcome this problem. This research line has a very strong improvement in space in the planed distribution of the new labs.

- Engineered Ceramics for Extreme Environments

- **Action to execute:** Add **Priority:** 2

- **Justification:**According to previous results and proposed objectives, this research line has received priority 2. This research line is a new emergent line that incorporates in the next period (21010-2013). The proposed line is based on the integration of 6 researchers from the external unit, with Solid State Physic background. This new structure constitutes the main strategy presented in the line and aims to improve the connexion between Solid State physicists and Chemists. We propose several actions in order to facilitate the incorporation and with the aim to overcome weaknesses and threats:

-The incorporation of new young researchers (JAE senior, Post-doc and Pre-doc) is crucial to successfully achieve the foreseen objectives of the research line.

- The incorporation of technicians for the research line is expected. This will greatly improve the scientific capabilities of the line, through both helping to carry out the research projects with industries and operating and performing maintenance of large equipments.

- A main weakness is the lack of some mechanical properties facilities at high temperature. Application for funds in competitive calls for infrastructure will be carried out regarding the acquisition of a high temperature indenter.

-The required space neccessary for this research line has been considered in the planed distribution of the new labs. The incorporation of 6 permanent researchers from the Physics Faculty has been considered.

Staff actions

- Tailored Nanomaterials and Microstructure

- **TS:** 1 **HSO:** 0 **IST:** 0 **RA:** 0 **PosD:** 2 **PreD:** 2 **Senior:** 0 **Tec:** 1
Priority: 1

- **Justification:** The values included here correspond to a minimum that each line expect to achieve in the 2010-2013 period. The total number of assigned positions is however smaller than the requested number of positions by each line. The assignment has been done according to previous production and proposed objectives. At the adequate moment also the CV of candidates will be considered.

- Mechanochemistry and Reactivity of Materials

- **TS:** 0 **HSO:** 0 **IST:** 1 **RA:** 0 **PosD:** 1 **PreD:** 2 **Senior:** 1 **Tec:** 1
Priority: 2

- **Justification:** The values included here correspond to a minimum that each line expect to achieve in the 2010-2013 period. The total number of assigned positions is however smaller than the requested number of positions by each line. The assignment has been done according to previous production and proposed objectives. At the adequate moment also the CV of candidates will be considered.

- Nanostructured Functional Materials

- **TS:** 2 **HSO:** 0 **IST:** 0 **RA:** 0 **PosD:** 3 **PreD:** 2 **Senior:** 0 **Tec:** 1
Priority: 1

- **Justification:** The values included here correspond to a minimum that each line expect to achieve in the 2010-2013 period. The total number of assigned positions is however smaller than the requested number of positions by each line. The assignment has been done according to previous production and proposed objectives. At the adequate moment also the CV of candidates will be considered.

- Catalysis for environment and energy

- **TS:** 1 **HSO:** 1 **IST:** 0 **RA:** 0 **PosD:** 2 **PreD:** 2 **Senior:** 0 **Tec:** 1
Priority: 1

- **Justification:** The values included here correspond to a minimum that each line expect to achieve in the 2010-2013 period. The total number of assigned positions is however smaller than the requested number of positions by each line. The assignment has been done according to previous production and proposed objectives. At the adequate moment also the CV of candidates will be considered.

- Engineered Ceramics for Extreme Environments

- **TS:** 0 **HSO:** 0 **IST:** 1 **RA:** 0 **PosD:** 2 **PreD:** 2 **Senior:** 1 **Tec:** 1
Priority: 2

- **Justification:** The values included here correspond to a minimum that each line expect to achieve in the 2010-2013 period. The total number of assigned positions is however smaller than the requested number of positions by each line. The assignment has been done according to previous production and proposed objectives. At the adequate moment also the CV of candidates will be considered.

Equipment actions

- Tailored Nanomaterials and Microstructure

- **Action to execute:** Increase **Priority:** 2

- **Justification:** The pursued strategy will be to applicate for founds in competitive calls for infraestructure acquisitions. The first priority of equipment acquisition corresponds to the

requirements defined by the general services. In a second stage also equipment for the research lines is foreseen.

In this research line following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- Nanoindentation ? lateral force microscopy (500.000 ?)

- Mechanochemistry and Reactivity of Materials

- **Action to execute:** Increase **Priority:** 2

- **Justification:**The pursued strategy will be to applicate for funds in competitive calls for infrastructure acquisitions. The first priority of equipment acquisition corresponds to the requirements defined by the general services. In a second stage also equipment for the research lines is foreseen.

In this research line following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- High temperature dilatometer (150.000 ?)

- Gas chromatography coupled to Mass Spectrometer (MS/GC) (100.000 ?)

- Nanostructured Functional Materials

- **Action to execute:** Increase **Priority:** 2

- **Justification:**The pursued strategy will be to applicate for funds in competitive calls for infrastructure acquisitions. The first priority of equipment acquisition corresponds to the requirements defined by the general services. In a second stage also equipment for the research lines is foreseen.

In this research line following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- Life time measurement of excited states (300.000 ?)

- Atomic layer deposition equipment (150.000 ?)

- Catalysis for environment and energy

- **Action to execute:** Increase **Priority:** 2

- **Justification:**The pursued strategy will be to applicate for funds in competitive calls for infrastructure acquisitions. The first priority of equipment acquisition corresponds to the requirements defined by the general services. In a second stage also equipment for the research lines is foreseen.
seen.

In this research line following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- Acquisition of an XPS mainly suited for catalysis studies (700.000 ?)

- Engineered Ceramics for Extreme Environments

- **Action to execute:** Increase **Priority:** 2

- **Justification:**The pursued strategy will be to applicate for funds in competitive calls for infrastructure acquisitions. The first priority of equipment acquisition corresponds to the requirements defined by the general services. In a second stage also equipment for the research lines is foreseen.

In this research line following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:



-Indenter with a high temperature chamber (300.000 ?)

Strategy on Services

Global actions

- SPECTROSCOPY SERVICE
- **Action to execute:** maintain **Priority:** 2
- **Justification:**As a general strategy we intend at least to maintain operative the techniques we already have. In addition to that the general services will intend to be more self-financing. Nevertheless the actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very low or even gratis in many equipments.
At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- Textural and Thermal Analysis Service
- **Action to execute:** maintain **Priority:** 2
- **Justification:**As a general strategy we intend at least to maintain operative the techniques we already have. In addition to that the general services will intend to be more self-financing. Nevertheless the actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very low or even gratis in many equipments. At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- Electron Microscopy Service
- **Action to execute:** maintain **Priority:** 1
- **Justification:**-As a general strategy we intend at least to maintain operative the techniques we already have. In addition to that the general services will intend to be more self-financing. Nevertheless the actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very low or even gratis in many equipments.
-This service is the one giving the highest variety of services and is also producing a highly specialised offer of analysis upon demand. In addition to the general strategy of keeping into operation the actual facilities, this service will intend to become a leading facility in the Andalusian region for Electron Microscopy Analysis. The new opportunities on Nanoscience and Nanotechnology fields will be an additional driving force for this Service to reach this leading position.
At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- X-ray diffraction laboratory
- **Action to execute:** maintain **Priority:** 2
- **Justification:**As a general strategy we intend at least to maintain operative the techniques we already have. In addition to that the general services will intend to be more self-financing. Nevertheless the actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very low or even gratis in many equipments.

At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- Surface Analysis Service

- **Action to execute:** Add **Priority:** 1

- **Justification:** The Institute has invested since its creation in the acquisition of surface analysis techniques, specially photoemission equipments. It is necessary however to incorporate this equipments to the service scheme of the Institute. Easy access routines and support to users should be available. A technician will be incorporated immediately (end of 2008) to avoid dependence of the service on the scientific staff personnel. The up-date of obsolete electronics is necessary to put into service the actual equipments. The acquisition of a new photoemission equipment to keep into operation the techniques in an actualized and competitive way is foreseen.

At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- Servicio de Diseño Mecánico y Electrónico

- **Action to execute:** Bolster **Priority:** 1

- **Justification:** The Institute strongly supports the improvement of our mechanical and electronic workshops. The realisation of prototypes, small pieces and equipment, "in situ" repair of components and many other advantages put the Institute in a very good position for developing more ambitious and demanding projects.

The actual concept of our services is mainly as support of researchers and research lines. The prices for use of the general services are very short or even gratis in this service. In the case of our Workshops it is planned that for the future the service could achieve a certain degree of self-financing by participating in external contracts.

At the beginning of 2009 an integrated quality program will start to be implanted first in the general service departments. The EFQM protocol will be followed aiming to be evaluated for the first phase at the 2012-2013 period.

- Apoyo a Dirección y Secretaría

- **Action to execute:** maintain **Priority:** 1

- **Justification:** The small team working as a support for the Direction/Manager of the Institute should be maintained.

Staff actions

- SPECTROSCOPY SERVICE

- **TS:** 0 **HSO:** 1 **IST:** 0 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 1

Priority: 2

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- Textural and Thermal Analysis Service

- **TS:** 0 **HSO:** 0 **IST:** 0 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 1

Priority: 2

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into

operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- Electron Microscopy Service

- **TS:** 0 **HSO:** 0 **IST:** 0 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 1 **Tec:** 1
Priority: 1

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- X-ray diffraction laboratory

- **TS:** 0 **HSO:** 1 **IST:** 0 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 0
Priority: 2

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- Surface Analysis Service

- **TS:** 0 **HSO:** 1 **IST:** 0 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 1
Priority: 1

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- Servicio de Diseño Mecánico y Electrónico

- **TS:** 0 **HSO:** 0 **IST:** 1 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 1
Priority: 1

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way. If additional positions are available the "Governing board" of the Institute will assign further position according to achievement of objectives and necessities of the service.

- Apoyo a Dirección y Secretaría

- **TS:** 0 **HSO:** 0 **IST:** 1 **RA:** 0 **PosD:** 0 **PreD:** 0 **Senior:** 0 **Tec:** 0
Priority: 2

- **Justification:** The requested personnel are the minimum desirable incorporations to keep into operation the service in an effective way.

Equipment actions

- SPECTROSCOPY SERVICE

- **Action to execute:** maintain **Priority:** 2

- **Justification:** The priority of equipment acquisition corresponds to substitution and keeping into operation the more basic resources in an actualized and competitive way. Application for funds in competitive calls for infrastructure will be carried out. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:



- Substitution of FTIR general equipment (90.000 ?)
- Substitution of UV-VIS spectrometer (30.000 ?)

- Textural and Thermal Analysis Service

- **Action to execute:** maintain **Priority:** 2

- **Justification:** The priority of equipment acquisition corresponds to substitution and keeping into operation the more basic resources in an actualized and competitive way. Application for funds in competitive calls for infrastructure will be carried out. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- Additional Physio-sorption equipment (50.000 ?)

- Electron Microscopy Service

- **Action to execute:** Increase **Priority:** 1

- **Justification:** The pursued strategy for the equipment acquisitions will be to dedicate funds received from the EQUIPA program of the CSIC as co-financial support for applications at the national and regional infrastructure programmes. The priority of equipment acquisition corresponds to substitution and keeping into operation the more basic resources in an actualized and competitive way. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- New Analytical high resolution TEM general equipment actualized (with STEM and HAAD) (960.000).

The service also aims to become a major infrastructure facility at regional and national level in the field of HRTEM. A complete scientific project will be elaborated to be presented to adequate infrastructure calls taking into consideration the financial support of the EQUIPA program.

- X-ray diffraction laboratory

- **Action to execute:** maintain **Priority:** 2

- **Justification:** The priority of equipment acquisition corresponds to substitution and keeping into operation the more basic resources in an actualized and competitive way. Application for funds in competitive calls for infrastructure will be carried out. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- New capabilities for polar plots, texture analysis and low angle acquisition.

- Surface Analysis Service

- **Action to execute:** Increase **Priority:** 1

- **Justification:** The pursued strategy for the equipment acquisitions will be to dedicate funds received from the EQUIPA program of the CSIC as co-financial support for applications at the national and regional infrastructure programmes. The priority of equipment acquisition corresponds to substitution and keeping into operation the more basic resources in an actualized and competitive way. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- New equipment for XPS service (750.000 ?)

This acquisition is associated to the put into operation for service of the actual equipments and includes the up-dating of the electronic in the oldest photoemission equipment.

- Servicio de Diseño Mecánico y Electrónico

- **Action to execute:** Increase **Priority:** 1

- **Justification:** The priority of equipment acquisition corresponds to substitution and keeping



into operation the more basic resources in an actualized and competitive way. Application for funds in competitive calls for infrastructure will be carried out. In this service following equipment has been identified as prioritised for its acquisition in the 2010-2013 period:

- Provision of the mechanical workshop general equipment (280.000 ?).

- Apoyo a Dirección y Secretaría
- **Action to execute:** maintain **Priority:** 1
- **Justification:** Small actions regarding up-dating of computers, printers, photocopy equipment, etc.

Progress Indicators (Quantitative objectives)

Progress Indicators (Quantitative objectives)

		Indicator	2010	2011	2012	2013
Funding(k€)	Research projects		1700	1750	1850	1900
	I+D Contract		100	150	200	250
Article / Book chapters (number)	HIGH Percentil 75		59	65	74	81
	MEDIUM Percentil 50-75		28	27	29	30
	LOW Percentil <50		15	14	11	12
Congress(number)	HIGH Percentil 75		20	24	27	30
	MEDIUM Percentil 50-75		12	12	12	11
	LOW Percentil <50		8	7	6	5
Full books(number)	HIGH Percentil 75		1		1	
	MEDIUM Percentil 50-75					
	LOW Percentil <50					
Knowledge Transfer(number)	Requested priority patents		3	3	3	3
	Licensed priority patents		1	1	1	1
	Spin-Offs					
		Indicator	2010	2011	2012	2013
Training (number)	Theses		7	7	8	8
	Courses & masters (hours)		400	400	450	450
Outreach(number)	Events		3	3	3	3
	Material		2	2	2	2
Internationalisation (number)	Foreign staff		10	10	10	10
	Colaborations		10	10	10	10
	Co-authoring scientific articles		20	22	24	25
	Services in English?		70	70	70	70
Services	Self financing		0.082	0.086	0.090	0.090
	Relative efficiency respect to		1.02	1.04	1.07	1.09
	Electronic management implementation		55	60	65	70
Quality programme	Integrated program		N	N	S	S
	ISO certification					

Resources Applied for

Human resources

Personnel(number)	2010	2011	2012	2013	Total
Tenured Scientist	1	1	1	1	4
Higher Scientific Officer	1	1	1	1	4
Intermediate Specialist Technician	1	1	1	1	4
Research assistant	0	0	0	0	0
JAE-Senior	1	1	0	1	3
JAE-Doc	3	2	2	3	10
JAE-Pre	3	2	3	2	10
JAE-Tec	3	2	3	2	10

Financial resources

Action	2010	2011	2012	2013	Total
EQUIPA(k€)	100	800	0	200	1100

- Justification: --Personnel resources

All the research lines have expressed their necessities to increase the number of permanent researchers. It is also fundamental to incorporate young researchers at the post-doctoral and pre-doctoral level together with incorporation of technicians as described along the strategies proposed by all the research lines and services.

--Equipment acquisitions

The pursued strategy will be to dedicate funds received from the EQUIPA program of the CSIC as co-financial support for applications at the national and regional infrastructure programmes. In any case the priority of equipment acquisition corresponds to the priority defined by the general services starting from substitution and keeping into operation the basic resources in an actualized and competitive way but keeping in mind the strategy of going to state of the art technology in selected topics.

The necessity of improvement in our capabilities for microstructural characterization in the micro- and nano-scale has been emphasized regarding the HRTEM and XPS facilities.

i) Actuation on HRTEM (800 kEuros in 2011): The proposed budget will allow the renovation of the actual HRTEM microscope which is obsolete in technology and very old. In addition this budget will be used as co-financial support for applications to establish a major up-to-date facility for high resolution analytical electron microscopy as an Andalusian initiative.

Collaborations and contacts with other interested Universities and groups have already been started. It is clear that the ICMS should be strongly involved in any initiative in this direction considering the goal of achieving worldwide cutting-edge research in its areas of specialization. The maintenance of the actual capabilities will be in any case guaranteed.

iii) Actuation on XPS (200 kEuros in 2013): The proposed budget will allow the renovation of the analyzer in one of the XPS equipments which is very old and obsolete. In addition this budget will be used as co-financial support for application of new up to date equipment.

Also an actuation to improve the equipment of the mechanical workshop is foreseen for the 2010 year (100 kEuros)

Other identified necessities to be included in all possible applications for infrastructure in the



next years are following:

- Substitution of FTIR general equipment (90.000 ?)
- Additional Physico-sorption equipment (50.000 ?)
- Substitution of UV-VIS spectrometer (30.000 ?)
- Provision of the mechanical workshop general equipment (280.000 ?)
- Renovation of EDX and EELS facilities in the TEM; update of EDX for SEM and replacement of the ion mill facility (404.000 ?).
- New equipment for XPS service (750.000 ?)

In a second stage following equipment for the research lines is foreseen:

- Life time measurement of excited states (300.000 ?)
- High temperature dilatometer (150.000 ?)
- Gas chromatography coupled to Mass Spectrometer (MS/GC) (100.000 ?)
- Atomic layer deposition equipment (150.000 ?)
- Nanoindentation ? lateral force microscopy (500.000 ?)
- Indenter with a high temperature chamber (300.000 ?)



Assigned resources (Total)

Human resources

Personnel(number)	2010	2011	2012	2013	Total
Tenured Scientist	1	1	1	1	4
Higher Scientific Officer	1	0	1	1	3
Intermediate Specialist Technician	0	1	1	1	3
Research assistant	0	0	0	0	0
JAE-Senior	0	0	0	0	0
JAE-Doc	2	2	2	2	8
JAE-Pre	2	2	1	2	7
JAE-Tec	3	1	2	2	8
AGE Technician (Informatics)	0	0	0	0	0
Aux. Technician (Archives, Libraries and Museums)	0	0	0	0	0

Financial resources

Action	2010	2011	2012	2013	Total
EQUIPA(k€)	100	800	100	100	1100

Assigned resources (Scientific)

Human resources

Personnel(number)	2010	2011	2012	2013	Total
Tenured Scientist	1	1	1	1	4
Higher Scientific Officer	1	0	1	1	3
Intermediate Specialist Technician	0	1	1	1	3
Research assistant					0
JAE-Senior					0
JAE-Doc	2	2	2	2	8
JAE-Pre	2	2	1	2	7
JAE-Tec	3	1	2	2	8

Financial resources

Action	2010	2011	2012	2013	Total
EQUIPA(k€)	100	800	100	100	1100

- **Justification:** Criterios para la distribución de recursos del CSIC para el Plan de Actuación 2010-2013 en el área de Ciencia y Tecnología de Materiales

La distribución se ha realizado teniendo en cuenta la evaluación del panel así como las alegaciones del centro presentadas ante la comisión. Se ha tenido en cuenta también el tamaño del centro relativo al área para evitar los grandes desequilibrios como que a un centro muy pequeño se le asigne una porción muy superior a su peso porque su evaluación sea muy positiva (o viceversa). Por esto puede que la asignación final difiera ligeramente de lo hablado en nuestra entrevista con el director.

En el PE del área no figurará la distribución por líneas y sólo el cupo total del centro. En su momento, se tendrá en cuenta la priorización facilitada por el centro siempre y cuando esté debidamente respaldada tanto científicamente como por una población adecuada de candidatos.

El área se reserva un cupo de nueve plazas no preasignadas a centros y que serán distribuidas en la segunda mitad del periodo cubierto por el PE en función del rendimiento de los centros/líneas o de necesidades apreciadas entonces pero no previstas.

Para la distribución de otras dotaciones se ha hecho teniendo criterios como la capacidad demostrada de absorción de investigadores postdoctorales o dirección de tesis.

Y en particular para la infraestructura se ha examinado el historial reciente de inversión de los centros. Los directores han asumido el compromiso de asignar dichos recursos al centro y no a grupos específicos y mantener el control desde la dirección mediante el instrumento que se considere más adecuado. En todo caso los grupos demostrarán su interés en las técnicas contribuyendo a su financiación al menos en un 25-30%. Tal vez las anualidades no coincidan con las previsiones de inversión del centro pero es la única forma de ajustar toda el área simultáneamente dado que los montantes anuales están fijados.

Assigned resources(Management)

Human resources

Personnel(number)	2010	2011	2012	2013	Total
Tenured Scientist	0	0	0	0	0
Higher Scientific Officer	0	0	0	0	0
Intermediate Specialist Technician	0	0	0	0	0
Research assistant	0	0	0	0	0
JAЕ-Senior	0	0	0	0	0
JAЕ-Doc	0	0	0	0	0
JAЕ-Pre	0	0	0	0	0
JAЕ-Tec	0	0	0	0	0
AGE Technician (Informatics)	0	0	0	0	0
Aux. Technician (Archives, Libraries and Museums)	0	0	0	0	0

Financial resources

Action	2010	2011	2012	2013	Total
EQUIPA(k€)	0	0	0	0	0

- Justification: Recursos no científicos:

1 JAЕ-Tec perfil gestión (2012)

Criterios generales de asignación de recursos no científicos.

Uno de los aspectos a destacar es que en el presente Plan de Actuación se dispone, para su asignación a las unidades, centros e institutos, de unos recursos concretos y limitados: la previsión de plazas libres de Oferta de Empleo Público en las Escalas de Titulados Superiores del CSIC y de TITEs de OPIs (especialidad de gestión de I+D y similares), las de algunos Cuerpos Especiales de la Administración General del Estado (en el ámbito de bibliotecas, informática y museos), junto con las plazas de contratos JAЕ -Técnicos para el período 2010-2013.

No se incluyen, por tanto, plazas de las Escalas de Ayudantes y Auxiliares de Investigación de OPIs, por no existir la citada especialidad en las plazas libres; ni de funcionarios de Cuerpos Generales o de personal laboral fijo, por no haber existido Oferta de Empleo Público en los últimos años; no obstante, de conseguirse este tipo de plazas a lo largo de la vigencia del Plan, se procedería, lógicamente, a su distribución con los mismos criterios.

Tampoco se han considerado las peticiones de consolidación de empleo temporal, ya que los procesos de consolidación se desarrollan al margen de la Oferta de Empleo Público.

Asimismo, no se asignan modificaciones de las Relaciones de Puestos de Trabajo, que se llevarán a cabo por la Agencia CSIC en el marco del contrato de gestión que se apruebe para el período de vigencia del Plan de Actuación, ya que dicho marco está todavía en proceso de negociación.

Los recursos se han asignado teniendo en cuenta la dimensión del centro o instituto y de su plantilla actual, así como su evolución prevista, y, en su caso la previsión de entrada en funcionamiento de nuevos edificios.

Por otra parte, en este Plan de Actuación no se asignan recursos económicos para obras y



equipamientos no científicos, que seguirán distribuyéndose, como hasta la fecha, a través de las convocatorias anuales del Programa de Apoyo a la Infraestructura (PAI).

Por tanto debe destacarse que la no asignación de los recursos anteriormente citados se debe a no estar prevista la misma en el presente Plan de Actuación, y no a una denegación de las peticiones, que se estudiarán y atenderán, en la medida de lo posible, por los procedimientos establecidos para ello.