CURRÍCULUM VÍTAE NORMALIZADO

Alejandro Sanz Parras

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GOBIERNO DE ESPAÑA
MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

FECYT FUNDACIÓN ESPAÑOLA PARA LA CIENCIA Y LA TECNOLOGÍA

Summary of CV

This section describes briefly a summary of your career in science, academic and research; the main scientific and technological achievements and goals in your line of research in the medium -and long- term. It also includes other important aspects or peculiarities.

A total of 51 peer-reviewed papers, 24 as first author (including 4 in Physical Review Letters). Co-author of a paper published in Nature Communications (Science editor´s choice).
Supervision of a PhD thesis: Project title: Confinement effects in soft and polymeric condensed matter: Implications for nanotechnology.
H index: 17 (based on Web of Science).
Total number of citations: 904 (based on Web of Science).

Supervising and teaching activities:

Supervision of PhD students:
- Project title: Confinement effects in soft and polymeric condensed matter: Implications for nanotechnology. Co-director: Aurora Nogales. University issuing the qualification: Universidad Complutense de Madrid (Madrid, Spain). Student: Daniel Martínez Tong. Date of reading: 1/12/2014. Thesis work carried out at the Institute for the Structure of Matter (IEM-CSIC).

Supervision of MSc students:
- Project title: Dynamics of polymer under 3D nanoconfinement. Type of project: MSc degree. Co-director of thesis: Joao Cabral. University issuing the qualification: Imperial College London (London, United Kingdom). Student: Him Chen Wong. Date of reading: 27/09/2007. Master Thesis advised during my postdoctoral stay at Imperial College London.
- Project title: Structure and dynamics in self-assembled soft condensed matter. Type of project:
MSc degree. Co-director of thesis: Aurora Nogales. University issuing the qualification: Universidad Internacional Menéndez Pelayo (Madrid, Spain). Student: Jing Cui. Date of reading: 17/05/2013. Research work carried out at IEM-CSIC.

Supervision of problem-oriented projects (Roskilde University, Denmark). These projects are rated as 15 ECTS points, being an essential part of the curriculum for bachelor studies at Roskilde University:

- Project title: Cymatics. Type of project: Physics, 2nd semester. Date of examination: 24/06/2019. Number of students: 3.
- Project title: Mining asteroids. Type of project: Physics, 1st semester. Date of examination: 25/01/2019. Number of students: 5.
- Project title: An investigation of the tunable hydrophobicity of the polymer polydimethylsiloxane (PDMS) using soft lithography and laser diffraction analysis. Type of project: Physics, 2nd semester. Date of examination: 23/06/2016. Number of students: 2.
- Project title: Food science. Type of project: Physics, 5th semester. Date of examination: 22/01/2016. Number of students: 4.
- Project title: The change in physical properties when mixing PDMS and copper. Type of project: Physics, 4th semester. Date of examination: 22/06/2015. Number of students: 4.

General quality indicators of scientific research

This section describes briefly the main quality indicators of scientific production (periods of research activity, experience in supervising doctoral theses, total citations, articles in journals of the first quartile, H index...). It also includes other important aspects or peculiarities.

A total of 51 peer-reviewed papers, 24 as first author (including 4 articles in Physical Review Letters). Co-author of a paper published in Nature Communications (Science editor´s choice).
H index: 17 (based on Web of Science).
Total number of citations: 904 (based on Web of Science).
Average citations per item: 18 (based on Web of Science).
Number of articles in first quartile journals: 36 (based on Web of Science).
Average citations per year during postdoctoral period: 63 (based on Web of Science).
Four highlights in scientific large-scale facilities annual reports.
Two book chapters.

Alejandro Sanz Parras

Surname(s): **Sanz Parras**
Name: **Alejandro**
ORCID: **0000-0001-5103-4049**
Gender: **Male**
Nationality: **Spain**
City of birth: **Madrid**
Email: **asanzparras@gmail.com**

Previous positions and activities

	Employing entity	Professional category	Start date
1	Roskilde University	Senior Postdoctoral Researcher	01/09/2018
2	Roskilde University	Senior Postdoctoral Researcher	15/03/2017
3	Roskilde University	Senior Postdoctoral Researcher	01/10/2014
4	Consejo Superior de Investigaciones Científicas	Research associate	01/08/2012
5	Consejo Superior de Investigaciones Científicas	Research associate	06/06/2011
6	Consejo Superior de Investigaciones Científicas	Research associate (JAE-Doc Fellow)	16/05/2008
7	Imperial College London	Postdoctoral Researcher (Postdoctoral fellowship awarded by MEC)	01/03/2006
8	Consejo Superior de Investigaciones Científicas	PhD student	01/01/2002
9	Universidad de Alcalá	Research internship	01/07/2001

1 **Employing entity:** Roskilde University **Type of entity:** University
Department: Physics and Mathematics, Department of Science and Environment
City employing entity: Roskilde, Denmark
Professional category: Senior Postdoctoral Researcher
Start-End date: 01/09/2018 - 30/06/2019 **Duration:** 10 months
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 220609 - Organic molecules; 221026 - Scattering phenomena; 221090 - Chemistry-Physics of Polymers; 221307 - Phase transition
Performed tasks: - Research on physicochemical properties of soft matter. - High-pressure physics. - University level teaching activities: supervision of problem-oriented projects (each project 15 ECTS points): Project title: Cymatics. Type of project: Physics, 2nd semester. Date of examination: 24/06/2019. Number of students: 3. Project title: Mining asteroids. Type of project: Physics, 1st semester. Date of examination: 25/01/2019. Number of students: 5.
Identify key words: Experimental and theoretical results of atoms and molecules physical behaviour; Polymers; Complex fluids

2 **Employing entity:** Roskilde University **Type of entity:** University
Department: Physics and Mathematics, Department of Science and Environment
City employing entity: Roskilde, Denmark
Professional category: Senior Postdoctoral Researcher
Start-End date: 15/03/2017 - 30/06/2018 **Duration:** 1 year - 3 months - 15 days
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 220609 - Organic molecules; 221018 - Liquid state physics; 221300 - Thermodynamics
Performed tasks: - Research on physicochemical properties of soft matter. - High-pressure physics. Design and development of novel experimental devices. - University level teaching activities: supervision of problem-oriented projects (15 ECTS credits).
Identify key words: Experimental and theoretical results of atoms and molecules physical behaviour; Polymers; Complex fluids

3 **Employing entity:** Roskilde University **Type of entity:** University
Department: Physics and Mathematics, Department of Science and Environment
City employing entity: Roskilde, Denmark
Professional category: Senior Postdoctoral Researcher
Start-End date: 01/10/2014 - 30/09/2016 **Duration:** 2 years
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 220609 - Organic molecules; 221018 - Liquid state physics; 221307 - Phase transition
Performed tasks: - Coordinator of an international instrument-technique development project in collaboration with the neutron source facility Institut Laue Langevin (Grenoble, France). - Research on physicochemical properties of soft matter. - University level teaching activities: supervision of problem-oriented projects (each project 15 ECTS points): Project title: An investigation of the tunable hydrophobicity of the polymer polydimethylsiloxane (PDMS) using soft lithography and laser diffraction analysis. Type of project: Physics, 2nd semester. Date of examination: 23/06/2016. Number of students: 2. Project title: Food science. Type of project: Physics, 5th semester. Date of examination: 22/01/2016. Number of students: 4. Project title: The change in physical properties when mixing PDMS and copper. Type of project: Physics, 4th semester. Date of examination: 22/06/2015. Number of students: 4.
Identify key words: Experimental and theoretical results of atoms and molecules physical behaviour; Polymers; Complex fluids

4 **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Department: Física Macromolecular, Instituto de Estructura de la Materia
City employing entity: Madrid, Community of Madrid, Spain
Professional category: Research associate **Educational Management (Yes/No):** No
Start-End date: 01/08/2012 - 31/12/2013 **Duration:** 1 year - 5 months
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 221026 - Scattering phenomena; 221032 - Thermodynamics; 221107 - Dielectrics; 221126 - Solid state devices; 221307 - Phase transition; 230408 - Macromolecules
Performed tasks: The main objective of my current research is to make conjugated polymer nanoblends by miniemulsion techniques and investigate the structure and dynamics of the materials in order to understand how the properties at the nanoscale affect the macroscopic performance of future photovoltaic devices. Phase separation in polymer blends takes place macroscopically being extremely difficult to predict the dimension of the segregated domains. However, few years ago, a novel approach to obtain polymer nanoblends controlling the length scale of the segregated

domains was reported. This method is based on the formation of a miniemulsion of the polymer chains in a water/organic solvent mixture and subsequent deposition on a solid substrate. By using this approach it is possible to prepare blends containing nanoparticles made of two different polymers and, on the other hand, when the miniemulsion is formed by mixing up both polymers, biphasic blend nanospheres (both components in each nanoparticles) can be obtained. If conjugated polymers are considered, the electronic properties of the materials can be correlated with the structure and dynamics of the macromolecule, and preparation of blends of different polymers or polymer/nanoparticle systems enables the possibility of engineering the desired properties of the materials and therefore the optoelectronic performance of potential devices. The conversion of light into electricity has become a hot topic in the last years, demanding a great effort from the materials science community in order to have a fine control of structural and dynamic aspects of the photovoltaic devices. Solar cells based on blends of fullerene derivates with conjugated polymers have been under investigation for several years for their promising results on efficient charge generation and low cost. Polymer solar cells (PSC) are usually constructed by blending electron-donor with electron-acceptor polymers. It is well established that the performance of PSCs devices strongly depends on the structure and morphology adopted by the donor/acceptor blend and the quality of the interface between the blend and the layers that will act as electrodes in the device. In this research project, by using miniemulsion techniques, I aim to prepare nanoblends of different photoconductive polymers and organic systems.

5 **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Department: Instituto de Química Física Rocasolano
City employing entity: Madrid, Community of Madrid, Spain
Professional category: Research associate **Educational Management (Yes/No):** No
Start-End date: 06/06/2011 - 31/05/2012 **Duration:** 11 months - 25 days
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 221026 - Scattering phenomena; 221032 - Thermodynamics; 221307 - Phase transition
Performed tasks: Studies focused on the structural effects of the adsorption of low molecular weigths compounds by zeolites. To tackle this problem, the applicant used x-ray diffraction, Raman spectroscopy, neutron diffraction and computer simulations.

6 **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Department: Macromolecular Physics, Instituto de Estructura de la Materia
City employing entity: Madrid, Community of Madrid, Spain
Professional category: Research associate (JAE-Doc Fellow) **Educational Management (Yes/No):** No
Start-End date: 16/05/2008 - 15/05/2011 **Duration:** 3 years
Type of contract: Temporary employment contract
Dedication regime: Full time
Primary (UNESCO code): 220610 - Polymers; 221018 - Liquid state physics; 221026 - Scattering phenomena; 221307 - Phase transition
Performed tasks: Research on Soft Condensed Matter Physics. Studies on structure and dynamics of polymeric systems under confined environments, such as experimental work on block-copolymers, crystallization of polyesters, polymers intercalated in membranes at the nanoscale with technological implications. Also research in phase transitions in low molecular weight alcohols was carried out using several tools like dielectric spectroscopy, x-ray and neutron scattering and differential scanning calorimetry.

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Employing entity: Imperial College London **Type of entity:** University
Department: Chemical Engineering and Chemical Technology
City employing entity: London, United Kingdom
Professional category: Postdoctoral Researcher (Postdoctoral fellowship awarded by MEC) **Educational Management (Yes/No):** No
Start-End date: 01/03/2006 - 15/05/2008 **Duration:** 2 years - 2 months - 15 days
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Primary (UNESCO code): 220603 - Macromolecules (physics of); 220610 - Polymers; 221026 - Scattering phenomena; 221102 - Composites
Performed tasks: The research project dealt with the polymer dynamics under spatial nanoconfinemet. We studied polymer dynamics at different time and length scales using neutron scattering techniques and relaxation spectroscopies (dielectric and mechanical) in order to elucidate the dynamic consequences of nano-confinement of polymers using true nanocomposites, rather than thin polymer films. The addition of well-dispersed nanoparticles closely mimics the effects of thin-film confinement (decreasing Tg with increasing nanofiller content or decreasing supported film thickness).

8 **Employing entity:** Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Department: Macromolecular Physics, Instituto de Estructura de la Materia
City employing entity: Madrid, Community of Madrid, Spain
Professional category: PhD student **Educational Management (Yes/No):** No
Start-End date: 01/01/2002 - 31/12/2005 **Duration:** 4 years
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Dedication regime: Full time
Primary (UNESCO code): 220610 - Polymers; 221018 - Liquid state physics; 221026 - Scattering phenomena; 221307 - Phase transition
Performed tasks: Studies towards the PhD degree. Experimental work on the relationship between structure and dynamics of soft condensed matter. The main tasks involved the design of the research strategy, sample preparation, acquisition of several physical magnitudes and exhaustive data analysis.

9 **Employing entity:** Universidad de Alcalá **Type of entity:** University
Department: Faculty of Chemistry
City employing entity: Alcala de Henares, Community of Madrid, Spain
Professional category: Research internship
Start-End date: 01/07/2001 - 31/12/2001 **Duration:** 5 months
Type of contract: Grant-assisted student (pre or post-doctoral, others)
Primary (UNESCO code): 230600 - Organic chemistry
Performed tasks: Synthesys of organic compound with implications in biology.

Education

University education

1st and 2nd cycle studies and pre-Bologna degrees

1 **University degree:** Higher degree
Name of qualification: Postgraduate research project (Introduction to Scientific Research)
Degree awarding entity: Universidad de Alcalá **Type of entity:** University
Date of qualification: 01/09/2002

2 **University degree:** Higher degree
Name of qualification: Bachelor in Chemistry (Licenciado en Química)
Degree awarding entity: Universidad de Alcalá **Type of entity:** University
Date of qualification: 17/05/2000

Doctorates

Doctorate programme: Chemistry (Department of Chemical Physics) Thesis carried out at the Institute for the Structure of Matter-CSIC
Degree awarding entity: Universidad de Alcalá **Type of entity:** University
City degree awarding entity: Alcalá de Henares, Community of Madrid, Spain
Date of degree: 14/12/2005
DEA awarding entity: Universidad de Alcalá
Date DEA was awarded: 28/05/2005
Thesis title: Interrelationship between nanostructure and dynamics in soft condensed matter: polymers vs low molecular weight compounds
Thesis director: Tiberio A. Ezquerra Sanz
Thesis co-director: Aurora Nogales Ruiz
Obtained qualification: Cum-Laude

Language skills

Language	Listening skills	Reading skills	Spoken interaction	Speaking skills	Writing skills
French	A1	A1	A1	A1	A1
Danish	A2	A2	A2	A2	A2
English	C1	C1	C1	C1	C1

Teaching experience

General teaching experience

1 **Type of teaching:** International teaching
Name of the course: Second semester project
Type of programme: Bachelor's degree — **Type of teaching:** Problem-oriented project
Type of subject: Obligatory
University degree: Bachelor in Natural Sciences
Course given: Project title: Standing Waves
End date: 24/06/2019 — **Type of hours/ ECTS credits:** Credits
Hours/ECTS credits: 15
Entity: Roskilde University — **Type of entity:** University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Subject language: English

2 **Type of teaching:** International teaching
Name of the course: First semester project
Type of programme: Bachelor's degree — **Type of teaching:** Problem-oriented project
Type of subject: Obligatory
University degree: Bachelor in Natural Sciences
Course given: Project title: Mining asteroids
End date: 25/01/2019 — **Type of hours/ ECTS credits:** Credits
Hours/ECTS credits: 15
Entity: Roskilde University — **Type of entity:** University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Subject language: English

3 **Type of teaching:** International teaching
Name of the course: Second semester project
Type of programme: Bachelor's degree — **Type of teaching:** Problem-oriented project
Type of subject: Obligatory
University degree: Bachelor in Natural Sciences
Course given: Project title: An investigation into the tunable hydrophobicity of the polymer polydimethylsiloaxne (PDMS) using soft lithography and laser diffraction analysis
End date: 23/06/2016 — **Type of hours/ ECTS credits:** Credits
Hours/ECTS credits: 15
Entity: Roskilde University — **Type of entity:** University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Subject language: English

4 **Type of teaching:** International teaching
Name of the course: Fifth semester project
Type of programme: Bachelor's degree — **Type of teaching:** Problem-oriented project

Type of subject: Obligatory
University degree: Bachelor in Natural Sciences
Course given: Project title: Food science
End date: 22/01/2016 **Type of hours/ ECTS credits:** Credits
Hours/ECTS credits: 15
Entity: Roskilde University **Type of entity:** University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Subject language: English

5 **Type of teaching:** International teaching
Name of the course: Fourth semester project
Type of programme: Bachelor's degree **Type of teaching:** Problem-oriented project
Type of subject: Obligatory
University degree: Bachelor in Natural Sciences
Course given: Project title: The change in physical properties when mixing PDMS and copper
End date: 22/06/2015 **Type of hours/ ECTS credits:** Credits
Hours/ECTS credits: 15
Entity: Roskilde University **Type of entity:** University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Subject language: English

Experience supervising doctoral thesis and/or final year projects

1 **Project title:** Confinement effects in soft and polymeric condensed matter: Implications for nanotechnology
Type of project: Doctoral thesis
Co-director of thesis: Aurora Nogales Ruiz
Entity: Universidad Complutense de Madrid **Type of entity:** University
City of entity: Madrid, Community of Madrid, Spain
Student: Daniel Martínez Tong
Obtained qualification: Sobresaliente Cum Laude
Identify key words: Description; Structural phase transition; Polymers
Date of reading: 01/12/2014

2 **Project title:** Structure and dynamics in self-assembled soft condensed matter
Type of project: Master
Co-director of thesis: Aurora Nogales Ruiz
Entity: Universidad Internacional Menéndez Pelayo **Type of entity:** University
Student: Jing Cui
Obtained qualification: 1.67
Identify key words: Polymers
Date of reading: 17/05/2013

3 **Project title:** Dynamics of polymer under 3D nanoconfinement
Type of project: Master's degree
Co-director of thesis: Joao Cabral
Entity: Imperial College London **Type of entity:** University
City of entity: Londres, United Kingdom
Student: Him Chen Wong

Identify key words: Polymers
Date of reading: 27/09/2007

Scientific and technological experience

Scientific or technological activities

R&D projects funded through competitive calls of public or private entities

1 **Name of the project:** Matter
Type of project: Basic research (including archaeological digs, etc)
Entity where project took place: Roskilde University **Type of entity:** University
City of entity: Roskilde, Denmark
Nº of researchers: 15
Type of participation: Team member
Start-End date: 01/01/2017 - 31/12/2023 **Duration:** 5 years
Total amount: 5.300.000 €
Dedication regime: Full time
Applicant's contribution: Research on pressure densification effects in molecular glasses by using high-pressure dielectric spectroscopy methods.

2 **Name of the project:** Isochronal jumps in the phase diagram studied by neutron scattering
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** Non EU International
Degree of contribution: Researcher
Entity where project took place: Roskilde University **Type of entity:** University Department
City of entity: Roskilde, Denmark
Name principal investigator (PI, Co-PI....): Kristine Niss
Nº of researchers: 6
Funding entity or bodies:
The Danish Council for Independent Research **Type of entity:** State agency
City funding entity: Denmark

Type of participation: Team member
Name of the programme: Sapere Aude : Starting Grant
Start-End date: 01/11/2012 - 30/10/2017 **Duration:** 5 years
Total amount: 945.683 €
Dedication regime: Full time
Applicant's contribution: International project coordinator of activities, resources and equipment for developing a new experimental setup for carrying out simultaneously, for the first time, neutron scattering and dielectric spectroscopy measurements under high pressure.

3 **Name of the project:** Nanostructuring polymers and hybrid systems: a synergetic approach towards functionality
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** National
Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency

Name principal investigator (PI, Co-PI....): Mari Cruz García Gutiérrez
Nº of researchers: 4
Funding entity or bodies:
Ministerio de Economía y Competitividad **Type of entity:** State agency

Type of participation: Team member
Code according to the funding entity: MAT2011-23455
Start-End date: 01/01/2012 - 31/12/2014 **Duration:** 3 years
Total amount: 115.000 €
Dedication regime: Full time

4 **Name of the project:** Nanocomposites based on reversible crosslinked thermoplastics polymers: Dielectric properties
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** Non EU International
Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency
City of entity: Madrid, Community of Madrid, Spain
Name principal investigator (PI, Co-PI....): Esperanza Cagiao Escohotado
Nº of researchers: 18
Funding entity or bodies:
Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
City funding entity: Madrid, Community of Madrid, Spain

Type of participation: Team member
Code according to the funding entity: I-COOP0123
Start-End date: 01/06/2011 - 30/06/2013 **Duration:** 2 years
Participating entity/entities: Consejo Superior de Investigaciones Científicas; Universidad de Sétif
Total amount: 18.500 €
Dedication regime: Part time

5 **Name of the project:** Density fluctuations in polymers prior to crystallization
Identify key words: Structural phase transition; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Researcher
Entity where project took place: Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City of entity: Hamburg, Germany
Name principal investigator (PI, Co-PI....): Aurora Nogales Ruiz
Nº of researchers: 3
Funding entity or bodies:
EU Commission: EU-Project CALIPSO **Type of entity:** Public Research Body

Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City funding entity: Hamburg, Germany

Type of participation: Team member
Code according to the funding entity: I-20120051 EC
Start-End date: 01/06/2012 - 31/05/2013 **Duration:** 1 year
Participating entity/entities: Consejo Superior de Investigaciones Científicas
Total amount: 4.800 €

Dedication regime: Part time

6 **Name of the project:** Microscopic relaxation in disordered and ordered diblock copolymers studied by XPCS
Identify key words: Structural phase transition; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Coordinator of total project, network or consortium
Entity where project took place: Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City of entity: Hamburg, Germany
Name principal investigator (PI, Co-PI....): Alejandro Sanz Parras
Nº of researchers: 3
Funding entity or bodies:
EU Commission: EU-Project CALIPSO **Type of entity:** Public Research Body

Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City funding entity: Hamburg, Germany

Type of participation: Co-ordinator
Code according to the funding entity: I-20120060 EC
Start-End date: 01/06/2012 - 31/05/2013 **Duration:** 1 year
Participating entity/entities: Consejo Superior de Investigaciones Científicas
Total amount: 4.800 €
Dedication regime: Part time

7 **Name of the project:** Physical processes in confining conditions: adsorption, self-assembling and phase transitions in porous media
Type of project: Basic research (including archaeological digs, etc)
Degree of contribution: Researcher
Entity where project took place: Instituto de Química Física Rocasolano **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Enrique Lomba
Nº of researchers: 4
Funding entity or bodies:
Ministerio de Economía y Competitividad **Type of entity:** State Ministry

Type of participation: Team member
Code according to the funding entity: FIS2010-15502
Start-End date: 01/01/2010 - 31/12/2012
Total amount: 131.285 €

8 **Name of the project:** Structure, dynamics and their interrelations in nanostructured polymeric materials in 1, 2 and 3 dimensions
Identify key words: Structural phase transition; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** National
Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency
City of entity: Madrid, Community of Madrid, Spain
Name principal investigator (PI, Co-PI....): TIberio A. Ezquerra Sanz

Nº of researchers: 6
Funding entity or bodies:
Ministerio de Ciencia e Innovación. Investigación **Type of entity:** State Ministry
City funding entity: Madrid, Community of Madrid, Spain

Type of participation: Team member
Code according to the funding entity: MAT2009-07789
Start-End date: 01/01/2010 - 31/12/2012 **Duration:** 2 years
Total amount: 150.000 €
Dedication regime: Part time

9 **Name of the project:** Density fluctuation dynamics in diblock copolymers
Identify key words: Structural phase transition; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Coordinator of total project, network or consortium
Entity where project took place: Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City of entity: Hamburg, Germany
Name principal investigator (PI, Co-PI....): Alejandro Sanz Parras
Nº of researchers: 3
Funding entity or bodies:
EU Commission: EU-Project CALIPSO **Type of entity:** Public Research Body

Hamburger Synchrotronstrahlungslabor, DESY HASYLAB **Type of entity:** R&D Centre
City funding entity: Hamburg, Germany

Type of participation: Co-ordinator
Code according to the funding entity: I-20110191 EC
Start-End date: 01/06/2011 - 31/05/2012 **Duration:** 1 year
Total amount: 4.800 €
Dedication regime: Part time

10 **Name of the project:** Segmental dynamics of linear and cross-linked polyisoprene in natural rubber
Identify key words: Structural phase transition; Polymers; Biological physics
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Coordinator of total project, network or consortium
Entity where project took place: Rutherford Appleton Laboratory ISIS **Type of entity:** R&D Centre
City of entity: United Kingdom
Name principal investigator (PI, Co-PI....): Alejandro Sanz Parras
Nº of researchers: 3
Funding entity or bodies:
European Commission **Type of entity:** Public Research Body

Rutherford Appleton Laboratory ISIS: EU NMI3 programme **Type of entity:** R&D Centre

Type of participation: Co-ordinator
Code according to the funding entity: EUNMI3: Contract No: 283883
Start-End date: 01/01/2011 - 31/12/2011
Participating entity/entities: Consejo Superior de Investigaciones Científicas

Total amount: 4.800 €
Dedication regime: Part time

11 **Name of the project:** Confined dynamics in semicrystalline polymers
Identify key words: Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Coordinator of total project, network or consortium
Entity where project took place: Forschungsneutronenquelle Heinz Maier-Leibnitz **Type of entity:** R&D Centre
City of entity: Munchen, Germany
Name principal investigator (PI, Co-PI....): Alejandro Sanz Parras
Nº of researchers: 3
Funding entity or bodies:
European Commission **Type of entity:** Public Research Body

Forschungsneutronenquelle Heinz Maier-Leibnitz: EU NMI3 programme **Type of entity:** Technological Centre

Type of participation: Co-ordinator
Code according to the funding entity: EUNMI3: Contract No. 226507
Start-End date: 01/01/2009 - 31/12/2009 **Duration:** 1 year
Participating entity/entities: Consejo Superior de Investigaciones Científicas
Total amount: 5.000 €
Dedication regime: Part time

12 **Name of the project:** Multiple phase behaviour in supercooled ethanol: a simultaneous dielectric
Identify key words: Structural phase transition; Structure; Spectroscopy
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Coordinator of total project, network or consortium
Entity where project took place: Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, Rhône-Alpes, France
Name principal investigator (PI, Co-PI....): Alejandro Sanz Parras
Nº of researchers: 5
Funding entity or bodies:
Institut Laue Langevin **Type of entity:** R&D Centre
City funding entity: Grenoble, Rhône-Alpes, France

Type of participation: Co-ordinator
Code according to the funding entity: ILL RESEARCH PROPOSAL 41346
Start-End date: 01/01/2009 - 31/12/2009 **Duration:** 1 year
Participating entity/entities: Consejo Superior de Investigaciones Científicas; Institut Laue Langevin (Grenoble, France)
Total amount: 4.000 €
Dedication regime: Part time

13 **Name of the project:** Structure-properties interrelationships in nanostructured polymeric materials and composites in volume and 2 dimensions
Identify key words: Structural phase transition; Structure; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union

Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency
City of entity: Madrid, Community of Madrid, Spain
Name principal investigator (PI, Co-PI....): Tiberio A. Ezquerra Sanz
Nº of researchers: 6
Funding entity or bodies:
Ministerio de Ciencia e Innovación. Investigación **Type of entity:** State Ministry
City funding entity: Madrid, Community of Madrid, Spain

Type of participation: Team member
Code according to the funding entity: MAT2005-01768
Start-End date: 01/12/2005 - 30/06/2009 **Duration:** 4 years - 6 months
Participating entity/entities: Consejo Superior de Investigaciones Científicas
Total amount: 148.750 €
Dedication regime: Part time

14 **Name of the project:** Macromolecular motion in isotropic nanoconfinement
Degree of contribution: Researcher
Entity where project took place: Imperial College London **Type of entity:** University
City of entity: London, Inner London, United Kingdom
Funding entity or bodies:
Royal Society **Type of entity:** Associations and Groups

Type of participation: Team member
Start-End date: 01/03/2006 - 31/05/2008
Dedication regime: Part time

15 **Name of the project:** Structure, stability and dynamics of multicomponent polymer mixtures
Degree of contribution: Researcher
Entity where project took place: Imperial College London **Type of entity:** University
City of entity: London, Inner London, United Kingdom
Funding entity or bodies:
EPRSC **Type of entity:** State agency

Type of participation: Team member
Start-End date: 01/03/2006 - 31/05/2008
Dedication regime: Full time

16 **Name of the project:** Simultaneous Measurements of SAXS, WAXS and Dielectric Spectroscopy in Advanced Polymer Systems
Identify key words: Structural phase transition; Structure; Polymers
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency
Name principal investigator (PI, Co-PI....): Tiberio A. Ezquerra Sanz
Nº of researchers: 4
Funding entity or bodies:
Type of entity: Technological Centre

Hamburger Synchrotronstrahlungslabor, DESY HASYLAB
City funding entity: Hamburg, Germany

Type of participation: Team member
Start-End date: 01/01/2004 - 31/12/2006 **Duration:** 3 years
Participating entity/entities: Consejo Superior de Investigaciones Científicas
Total amount: 10.800 €
Dedication regime: Part time

17 **Name of the project:** Design, construction and implementation of novel device for performing simultaneous dielectric spectroscopy with wide-small x-ray scattering measurements at the Spanish beam-line BM16 at the ESRF
Identify key words: Structural phase transition; Structure; Polymers; Physics - Instrumentation and data analysis
Type of project: Basic research (including archaeological digs, etc) **Geographical area:** European Union
Degree of contribution: Researcher
Entity where project took place: Instituto de Estructura de la Materia **Type of entity:** State agency
City of entity: Madrid, Community of Madrid, Spain
Name principal investigator (PI, Co-PI....): Tiberio A. Ezquerra Sanz
Nº of researchers: 4
Funding entity or bodies:
Ministerio de Ciencia e Innovación. Investigación **Type of entity:** State Ministry
City funding entity: Madrid, Community of Madrid, Spain

Type of participation: Team member
Code according to the funding entity: FPA-2001-2139
Start-End date: 01/01/2002 - 31/12/2004 **Duration:** 3 years
Participating entity/entities: Consejo Superior de Investigaciones Científicas; European Synchrotron Radiadion Facility (ESRF, Grenoble, France)
Total amount: 252.425 €
Dedication regime: Part time

R&D non-competitive contracts, agreements or projects with public or private entities

Name of the project: Synthesis of organic compounds with biological activity
Degree of contribution: Researcher
Name principal investigator (PI, Co-PI....): Juan José Vaquero
Nº of researchers: 4
Funding entity or bodies:
Eli Lilly and Company **Type of entity:** Business

Start date: 01/07/2001 **Duration:** 5 months
Total amount: 7.000 €

Scientific and technological activities

Scientific production

Publications, scientific and technical documents

1 Alejandro Sanz; Tina Hecksher; Henriette Wase Hansen; Jeppe C. Dyre; Kristine Niss; Ulf R. Pedersen. Experimental Evidence for a State-Point-Dependent Density-Scaling Exponent of Liquid Dynamics. Physical Review Letters. 122, pp. 055501 - 055501. American Physical Society, 2019. Available on-line at: <https://link.aps.org/doi/10.1103/PhysRevLett.122.055501>.

Type of production: Scientific paper **Format:** Journal

Corresponding author: Yes

Impact source: ISI

Impact index in year of publication: 8,839

Source of citations: WOS **Citations:** 6

Relevant publication: Yes

2 Alejandro Sanz; Tina Hecksher; Henriette Wase Hansen; Jeppe C. Dyre; Kristine Niss; Ulf R. Pedersen. Sanz et al. Reply:. Physical Review Letters. 123, pp. 189602 - 189602. American Physical Society, 2019. Available on-line at: <https://link.aps.org/doi/10.1103/PhysRevLett.123.189602>.

Type of production: Scientific paper **Format:** Journal

Corresponding author: Yes

Impact source: ISI

Impact index in year of publication: 8.839

Relevant publication: Yes

3 Henriette W. Hansen; Alejandro Sanz; Karolina Adrjanowicz; Bernhard Frick; Kristine Niss. Evidence of a one-dimensional thermodynamic phase diagram for simple glass-formers. Nature Communications. 9 - 518, pp. 1 - 7. Springer Nature, 2018. Available on-line at: <https://www.nature.com/articles/s41467-017-02324-3.pdf?origin=ppub>.

Type of production: Scientific paper **Format:** Journal

Corresponding author: No

Impact source: ISI

Impact index in year of publication: 12.12

Source of citations: WOS **Citations:** 10

Relevant publication: Yes

4 Alejandro Sanz; Henriette Wase Hansen; Bo Jakobsen; Ib H. Pedersen; Simone Capaccioli; Karolina Adrjanowicz; Marian Paluch; Julien Gonthier; Bernhard Frick; Eddy Lelièvre-Berna; Judith Peters; Kristine Niss. High-pressure cell for simultaneous dielectric and neutron spectroscopy. Review of Scientific Instruments. 89 - 2, pp. 023904 - 023904. 2018. Available on-line at: <https://doi.org/10.1063/1.5007021>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI

Impact index in year of publication: 1.515

Source of citations: WOS **Citations:** 3

Relevant publication: Yes

5 Henriette Wase Hansen; Bernhard Frick; Simone Capaccioli; Alejandro Sanz; Kristine Niss. Isochronal superposition and density scaling of the α-relaxation from pico- to millisecond. The Journal of Chemical Physics. 149 - 21, pp. 214503 - 214503. 2018. Available on-line at: <https://doi.org/10.1063/1.5055665>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI
Impact index in year of publication: 2.843

Source of citations: WOS **Citations:** 3

Relevant publication: Yes

6 Alejandro Sanz; Kristine Niss. Coupling between Molecular Mobility and Kinetics of Crystal Growth in a Hydrogen-Bonded Liquid. Crystal Growth & Design. 17 - 9, pp. 4628 - 4636. 2017. Available on-line at: <https://doi.org/10.1021/acs.cgd.7b00484>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI
Impact index in year of publication: 4.055

Source of citations: WOS **Citations:** 5

Relevant publication: Yes

7 Alejandro Sanz; Kristine Niss. Liquid dynamics in partially crystalline glycerol. The Journal of Chemical Physics. 146 - 4, pp. 044502 - 044502. 2017. Available on-line at: <https://doi.org/10.1063/1.4974831>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI
Impact index in year of publication: 2.965

Source of citations: WOS **Citations:** 2

Relevant publication: Yes

8 Vicente Sánchez-Gil; Eva G. Noya; Alejandro Sanz; Sheima J. Khatib; José María Guil; Enrique Lomba; Ramona Marguta; Susana Valencia. Experimental and Simulation Studies of the Stepped Adsorption of Toluene on Pure-Silica MEL Zeolite. The Journal of Physical Chemistry C. 120 - 16, pp. 8640 - 8652. 2016. Available on-line at: <https://doi.org/10.1021/acs.jpcc.6b00402>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI
Impact index in year of publication: 4.509

Source of citations: WOS **Citations:** 7

Relevant publication: Yes

9 Jing Cui; Daniel E. Martínez-Tong; Alejandro Sanz; Tiberio A. Ezquerra; Esther Rebollar; Aurora Nogales. Relaxation and Conductivity in P3HT/PC71BM Blends As Revealed by Dielectric Spectroscopy. Macromolecules. 49 - 7, pp. 2709 - 2717. 2016. Available on-line at: <https://doi.org/10.1021/acs.macromol.5b02727>.

Type of production: Scientific paper **Format:** Journal

Impact source: ISI
Impact index in year of publication: 5.554

Source of citations: WOS **Citations:** 10

Relevant publication: Yes

10 Bo Jakobsen; Alejandro Sanz; Kristine Niss; Tina Hecksher; Ib H. Pedersen; Torben Rasmussen; Tage Christensen; Niels Boye Olsen; Jeppe C. Dyre. Thermalization calorimetry: A simple method for investigating glass transition and crystallization of supercooled liquids. AIP Advances. 6 - 5, pp. 055019 - 055019. 2016. Available on-line at: <https://doi.org/10.1063/1.4952404>.

Type of production: Scientific paper
Format: Journal
Impact source: ISI
Impact index in year of publication: 1.444
Source of citations: WOS
Citations: 2
Relevant publication: Yes

11 D.E. Martínez-Tong; M. Soccio; A. Sanz; C. García; T.A. Ezquerra; A. Nogales. Ferroelectricity and molecular dynamics of poly(vinylidenefluoride-trifluoroethylene) nanoparticles. Polymer. 56, pp. 428 - 434. 2015. Available on-line at: <http://www.sciencedirect.com/science/article/pii/S0032386114010660>. ISSN 0032-3861

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 3.562
Journal in the top 25%: Yes
Position of publication: 16
No. of journals in the cat.: 82
Source of citations: WOS
Citations: 1

Relevant results: Here we show that ferroelectric polymeric nanoparticles of a poly(vinylidene fluoride-trifluoroethylene) random copolymer, can be prepared by dialysis nanoprecipitation. By this method semicrystalline particles with mean diameter of 280 nm, as revealed by atomic force microscopy, can be obtained. The ferroelectric nature at room temperature of the nanoparticles has been proven by piezoresponse force microscopy, differential scanning calorimetry, X-ray diffraction at wide angles and broad band dielectric spectroscopy. The poly(vinylidene fluoride-trifluoroethylene) nanoparticles exhibit a ferroelectric-toparaelectric transition at lower temperature compared with the bulk. In the paraelectric phase the nanoparticles show an intense dielectric relaxation process associated to the rotational motion of the dipoles within the paraelectric crystalline phase. The nature of this dielectric process is similar to that of the bulk.
Relevant publication: Yes

12 Alejandro Sanz; Him Cheng Wong; Alisyn J. Nedoma; Jack F. Douglas; João T. Cabral. Influence of C60 fullerenes on the glass formation of polystyrene. Polymer. 68, pp. 47 - 56. 2015. Available on-line at: <http://www.sciencedirect.com/science/article/pii/S0032386115004346>. ISSN 0032-3861

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 3.562
Journal in the top 25%: Yes
Position of publication: 16
No. of journals in the cat.: 82
Source of citations: WOS
Citations: 25

Relevant results: We investigate the impact of fullerene C60 on the thermal properties and glass formation of polystyrene (PS) by differential scanning calorimetry (DSC) and dielectric spectroscopy (DS), for C60 concentrations up to 30% mass fraction. The miscibility and dispersibility thresholds of PS/C60 nanocomposites are first estimated by a combination of microscopy, small angle neutron scattering (SANS) and wide-angle X-ray scattering (WAXS) experiments, and these thresholds were found to be x1 mass% and x4 mass% C60, respectively. The addition of C60 increases the glass-transition temperature (Tg) of rapidly precipitated PS

composites, up to a 'threshold' C60 concentration (x4 wt%, in agreement with the dispersibility estimate). Beyond this concentration, the Tg reverts gradually towards the neat PS value. We present a comprehensive study for composites based on PS of molecular mass 270 kg/mol, and demonstrate the generality of the impact of C60 on Tg for PS matrices of 2 and 20 kg/mol. Thermal annealing or slowly evaporated composites largely reverse these effects, as the dispersion quality decreases. The dynamic fragility m of the composite is found to increase in the presence of C60, but the scaling of m with Tg for PS is retained. Similarly, physical ageing experiments show a reduction of relaxation enthalpy in the glass regime, which is largely accounted for by the increase of Tg with C60. The slowing down of the PS arelaxation with C60 contrasts with the local 'softening' indicated by former Debye-Waller measurements and increase in fragility m. This effect is opposite to that of antiplasticizer additives, which both stiffen the material in the glassy state and reduce Tg, and simulations suggest this could be due to an increase in packing frustration. Finally, we review observations on the effect of nanoparticles on the Tg of PS and discuss the non-universal nature of Tg shifts by various types of nanoparticles.
Relevant publication: Yes

13 Alejandro Sanz; Tiberio A. Ezquerra; Rebeca Hernández; Michael Sprung; Aurora Nogales. Relaxation processes in a lower disorder order transition diblock copolymer. The Journal of Chemical Physics. 142 - 6, pp. 064904-1 - 064904-6. 2015. Available on-line at: <http://dx.doi.org/10.1063/1.4907722>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: PHYSICS, ATOMIC, MOLECULAR & CHEMICAL
Impact index in year of publication: 2.952
Journal in the top 25%: Yes
Position of publication: 8
No. of journals in the cat.: 34
Source of citations: WOS
Citations: 4

Relevant results: The dynamics of lower disorder-order temperature diblock copolymer leading to phase separation has been observed by X ray photon correlation spectroscopy. Two different modes have been characterized. A non-diffusive mode appears at temperatures below the disorder to order transition, which can be associated to compositional fluctuations, that becomes slower as the interaction parameter increases, in a similar way to the one observed for diblock copolymers exhibiting phase separation upon cooling. At temperatures above the disorder to order transition TODT, the dynamics becomes diffusive, indicating that after phase separation in Lower Disorder-Order Transition (LDOT) diblock copolymers, the diffusion of chain segments across the interface is the governing dynamics. As the segregation is stronger, the diffusive process becomes slower. Both observed modes have been predicted by the theory describing upper order-disorder transition systems, assuming incompressibility. However, the present results indicate that the existence of these two modes is more universal as they are present also in compressible diblock copolymers exhibiting a lower disorder-order transition. No such a theory describing the dynamics in LDOT block copolymers is available, and these experimental results may offer some hints to understanding the dynamics in these systems. The dynamics has also been studied in the ordered state, and for the present system, the non-diffusive mode disappears and only a diffusive mode is observed. This mode is related to the transport of segment in the interphase, due to the weak segregation on this system.
Relevant publication: Yes

14 A. Gallardo; J. M. Guil; E. Lomba; N. G. Almarza; S. J. Khatib; C. Cabrillo; A. Sanz; J. Pires. Adsorption of probe molecules in pillared interlayered clays: Experiment and computer simulation. The Journal of Chemical Physics. 140 - 22, pp. 224701-1 - 224701-14. 2014. Available on-line at: <http://dx.doi.org/10.1063/1.4880962>.

Type of production: Scientific paper
Format: Journal
Position of signature: 7
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 8
Corresponding author: No
Impact source: ISI
Category: PHYSICS, ATOMIC, MOLECULAR & CHEMICAL
Impact index in year of publication: 2.952
Journal in the top 25%: Yes
Position of publication: 8
No. of journals in the cat.: 34

Source of citations: WOS **Citations:** 0

Relevant results: In this paper we investigate the adsorption of various probe molecules in order to characterize the porous structure of a series of pillared interlayered clays (PILC). To that aim, volumetric and microcalorimetric adsorption experiments were performed on various Zr PILC samples using nitrogen, toluene, and mesitylene as probe molecules. For one of the samples, neutron scattering experiments were also performed using toluene as adsorbate. Various structural models are proposed and tested by means of a comprehensive computer simulation study, using both geometric and percolation analysis in combination with Grand Canonical Monte Carlo simulations in order to model the volumetric and microcalorimetric isotherms. On the basis of this analysis, we propose a series of structural models that aim at accounting for the adsorption experimental behavior, and make possible a microscopic interpretation of the role played by the different interactions and steric effects in the adsorption processes in these rather complex disordered microporous systems.
Relevant publication: Yes

15 A Linares; J C Canalda; A Sanz; A Szymczyk; Z Rosłaniec; T A Ezquerra. Broadband dielectric spectroscopy of nanocomposites based on PVDF and expanded graphite. IOP Conference Series: Materials Science and Engineering. 64 - 1, pp. 012003-1 - 012003-6. 2014. Available on-line at: <http://iopscience.iop.org/article/10.1088/1757-899X/64/1/012003/meta>.

Type of production: Scientific paper **Format:** Journal
Position of signature: 3 **Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6 **Corresponding author:** No
Impact source: SCOPUS
Impact index in year of publication: 0.143

Source of citations: WOS **Citations:** 1

Relevant results: Nanocomposites based on poly (vinylidene fluoride) (PVDF) and expanded graphite (EG) were prepared by non-solvent precipitation from solution with different EG concentrations. Films were obtained by compression molding and their structural and dielectric properties studied. From Wide Angle X-ray Scattering (WAXS) experiments, it can be assessed that for all EG concentrations the α-crystalline phase of PVDF is the predominant crystalline form. However, for composites with high nanoadditive content, higher than 3 wt.%, the (β-crystalline phase is also detected. Dielectric spectroscopy results showed that the nanocomposites present both high dielectric constant and electrical conductivity at low percolation threshold.
Relevant publication: Yes

16 Alejandro Sanz; Aurora Nogales; Mónica Jiménez Ruiz; Inés Puente Orench; Tiberio Ezquerra. Changes in mobility of plastic crystal ethanol during its transformation into the monoclinic crystal state. Journal of Chemical Physics. 140 - 5, pp. 054510-1 - 054510-6. AIP, 2014. Available on-line at: <http://dx.doi.org/10.1063/1.4863694>.

Type of production: Scientific paper **Format:** Journal
Position of signature: 1 **Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5 **Corresponding author:** Yes
Impact source: ISI **Category:** PHYSICS, ATOMIC, MOLECULAR & CHEMICAL
Impact index in year of publication: 2.952 **Journal in the top 25%:** Yes
Position of publication: 8 **No. of journals in the cat.:** 34

Source of citations: WOS **Citations:** 1

Relevant results: Transformation of deuterated ethanol from the plastic crystal phase into the monoclinic one is investigated by means of a singular setup combining simultaneously dielectric spectroscopy with neutron diffraction. We postulate that a dynamic transition from plastic crystal to supercooled liquid-like configuration through a deep reorganization of the hydrogen-bonding network must take place as a previous step of the crystallization process. Once these precursor regions are formed, subsequent crystalline nucleation and growth develop with time.

Relevant publication: Yes

17 Alejandro Sanz; Aurora Nogales; Inés Puente-Orench; Mari-Cruz García-Gutiérrez; Javier Campo; WolfgangHaussler; Michelina Soccio; Nadia Lotti; Andrea Munari; Tiberio A Ezquerra. Confined dynamics in poly(ethylene terephthalate): a coherent and incoherent neutron scattering study. Journal of Physics: Conference Series. 549 - 1, pp. 012011-1 - 012011-5. 2014. Available on-line at: <http://iopscience.iop.org/article/10.1088/1742-6596/549/1/012011/meta>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 10
Corresponding author: Yes
Impact source: SCOPUS
Impact index in year of publication: 0.217
Source of citations: WOS
Citations: 0

Relevant results: We show that the combination of dielectric relaxation with neutron spin echo and incoherent neutron backscattering measurements performed in deuterated and protonated poly(ethylene terephthalate) suggests that the intrinsic dynamics of semicrystalline polymers occurs in an homogeneous scenario, similar to that valid to describe the dynamics of totally amorphous polymers. The quasielastic neutron scattering data are satisfactorily described by a theoretical model that considers that the proton mobility follows a random jump-diffusion in a restricted environment.
Relevant publication: Yes

18 TiberioA. Ezquerra; JoséC. Canalda; Alejandro Sanz; Amelia Linares. On the electrical conductivity of PVDF composites with different carbon-based nanoadditives. Colloid and Polymer Science. 292 - 8, pp. 1989 - 1998. Springer Berlin Heidelberg, 2014. Available on-line at: <http://dx.doi.org/10.1007/s00396-014-3252-6>. ISSN 0303-402X

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 4
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 1.865
Journal in the top 25%: No
Position of publication: 32
No. of journals in the cat.: 82

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 1.865
Journal in the top 25%: No
Position of publication: 84
No. of journals in the cat.: 139

Source of citations: WOS
Citations: 14

Relevant results: Composites based on poly(vinylidene fluoride) (PVDF) and different carbon additives, such as carbon nanofibers (CNF), graphite (G), expanded graphite (EG), and single-walled carbon nanotubes (SWCNT) have been prepared by nonsolvent precipitation, from solution, and subsequent melt processing. From a structural point of view, the α-crystal phase is the predominant crystal form in all the nanocomposites. However, those containing CNF, G, and EG at high nanoadditive content present also β-crystal phase. Even though the intrinsic thermal properties of PVDF are hardly affected, the nanoadditives act as nucleating agents for the crystallization. In regard to the electrical properties, all nanocomposites exhibit a percolating behavior. Moreover, the fact that the nanocomposites present both high dc conductivity and high dielectric constant, in a certain nanoadditive concentration range below the percolation threshold, suggests that a tunneling conduction mechanism for charge transport is present. With regard to the ac electrical properties, depending on the morphology of the different additives, the charge transport above percolation threshold can be explained taking into account the anomalous diffusion effect for high nanoadditive content or an intercluster polarization mechanism when the nanoadditive concentration decreases.
Relevant publication: Yes

19 D. Martinez-Tong; M. Soccio; A. Sanz; C. García; T.A. Ezquerra; A. Nogales. Chain arrangement and glass transition temperature variations in polymer nanoparticles under 3D-confinement. Macromolecules. 46, pp. 4698 - 4705. 2013. Available on-line at: <http://dx.doi.org/10.1021/ma400379a>.

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal without external admissions assessment committee
Total no. authors: 6
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 5.521
Journal in the top 25%: Yes
Position of publication: 3
No. of journals in the cat.: 82
Source of citations: WOS
Citations: 22

Relevant results: Polymer nanospheres with different size distributions of poly(ethyl methacrylate) are prepared by two different methods, with and without the aid of a surfactant. The calorimetric trace of these spheres shows an increase of the glass transition temperature that has been evaluated by means of an entropy model. This 3D-confinement, imposed by the nanospheres, leads to a limiting number of repeating polymer units in the sphere and thus to a reduction of the possible configuration states of the polymer chains, which is ultimately related to variations in the bulk value of the glass transition temperature. Our model is evaluated against our calorimetric measurements as well as with the data available in the literature. Good agreement between data and model is found for many cases, proving that confinement is related to reductions in entropy for these systems.
Relevant publication: Yes

20 Alejandro Sanz; Tiberio A. Ezquerra; Mari Cruz García-Gutiérrez; Inés Puente-Orench; Javier Campo; Aurora Nogales. Localized translational motions in semicrystalline Poly(ethylene terephthalate) studied by Incoherent Quasielastic Neutron Scattering. European Physical Journal E. 36 - 3, pp. 24-1 - 24-9. Springer-Verlag, 2013. Available on-line at: <http://dx.doi.org/10.1140/epje/i2013-13024-1>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6
Corresponding author: Yes
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 2.183
Journal in the top 25%: No
Position of publication: 31
No. of journals in the cat.: 82

Impact source: ISI
Category: Science Edition - PHYSICS, APPLIED
Impact index in year of publication: 2.183
Journal in the top 25%: No
Position of publication: 40
No. of journals in the cat.: 136

Impact source: ISI
Category: Science Edition - MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 2.183
Journal in the top 25%: No
Position of publication: 67
No. of journals in the cat.: 251

Impact source: ISI
Category: Science Edition - CHEMISTRY, PHYSICAL
Impact index in year of publication: 2.183
Journal in the top 25%: No
Position of publication: 68
No. of journals in the cat.: 136

Source of citations: SCOPUS
Citations: 5

Relevant results: One of the simplest ways to confine polymeric materials is by self assembling during the crystallization process. The remaining amorphous phase is then constrained by the lamellar crystals. In this manuscript, we aim to shed additional light in the understanding of the amorphous chains dynamics of semicrystalline polymers above the Tg by using incoherent quasielastic neutron scattering QENS in a mesoscopic

timescale (10-9-10-10 s) on poly(ethylene terephthalate). The observed dynamics is satisfactorily described by a theoretical model that considers that the proton mobility follows a random jump-diffusion in a restricted environment. We demonstrate that the combination of macroscopic with microscopic dynamic tools allows a complete description of the confined dynamics on a paradigmatic semicrystalline polymer like poly(ethylene terephthalate).
Relevant publication: Yes

21 M. Hernández; A. Sanz; A. Nogales; T.A. Ezquerra; M. Lopez-Manchado. Structure and segmental dynamics relationship in natural rubber/layered silicate nanocomposites during uniaxial deformation. Macromolecules. 46, pp. 3176 - 3182. 2013. Available on-line at: <http://dx.doi.org/10.1021/ma4002353>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 5.927
Journal in the top 25%: Yes
Position of publication: 3
No. of journals in the cat.: 82
Source of citations: WOS
Citations: 9

Relevant results: Synchrotron X-ray scattering and broad-band dielectric spectroscopy experiments were performed in order to analyze the effect of strain-induced orientation on the structure/segmental dynamics relationship in natural rubber/layered silicate nanocomposites. The presence of interfacial interaction between nanoparticle− polymer matrix is crucial in promoting strain-induced crystallization in NR nanocomposites, as evidenced by the correlation between structural magnitudes and dynamic parameters. In this sense, the addition of nanoclay leads to enhanced crystallinity and lower onset of crystallization, while the segmental relaxation slows down due to the restriction imposed by the anchoring of chain segments into the crystals, with evidence of an amorphous/semicrystalline transition around a strain ratio λ = 2.5.
Relevant publication: Yes

22 N. Bitinis; A. Sanz; A. Nogales; R. Verdejo; M.A. Lopez-Manchado; T.A. Ezquerra. Deformation mechanisms in polylactic acid/natural rubber/organoclay bionanocomposites as revealed by synchrotron X-ray scattering. Soft Matter. 8 - 34, pp. 8990 - 8997. 2012. Available on-line at: <http://dx.doi.org/10.1039/C2SM25729G>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6
Corresponding author: Yes
Impact source: ISI
Category: PHYSICS, MULTIDISCIPLINARY
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 10
No. of journals in the cat.: 83

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 31
No. of journals in the cat.: 135

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 33
No. of journals in the cat.: 241

Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 8
No. of journals in the cat.: 83

Source of citations: WOS
Citations: 33

Relevant results: The micromechanical deformation mechanisms of a polylactic acid (PLA)/natural rubber (NR) blend (PLA/NR 90/10 wt%) and its organoclay filled bionanocomposites have been investigated by small and wide angle X-ray scattering (SAXS–WAXS) under tensile conditions. The addition of NR to a PLA matrix changed the brittle fracture of PLA to a ductile deformation through the debonding of the rubber droplets. Otherwise, the formation of cavities between PLA and NR was hampered by the nanoclays since they were mainly located at the polymer blend interface. In this case, the nanoclays acted as craze nucleation sites. At 1 wt% of filler concentration, the crazes were able to fully develop in the blend and to evolve into stable microvoids, which kept growing and orienting in the tensile direction. These mechanisms also explained the progressive plastic deformation of the polymer chains and the preferential orientation of the nanoclay platelets.
Relevant publication: Yes

23 D.E. Martinez-Tong; M. Soccio; A. Sanz; T.A. Ezquerra; N. Lotti; A. Munari; A. Nogales. Towards homogeneous dynamics in incompatible blends by selective transesterification. Soft Matter. 8 - 25, pp. 2723 - 2730. 2012. Available on-line at: <http://dx.doi.org/10.1039/c2sm25403d>.

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 7
Corresponding author: No

Impact source: ISI
Category: PHYSICS, MULTIDISCIPLINARY
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 10
No. of journals in the cat.: 83

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 31
No. of journals in the cat.: 135

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 33
No. of journals in the cat.: 241

Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 3.909
Journal in the top 25%: Yes
Position of publication: 8
No. of journals in the cat.: 83

Source of citations: WOS
Citations: 2

Relevant results: The evolution from two component dynamics towards homogeneous dynamics in originally incompatible blends of biodegradable aliphatic polyesters has been followed by dielectric spectroscopy. Transesterification reactions are responsible for the compatibilization process. However, our results indicate that the segmental dynamics are strongly modified even before any transesterification process is detected by 13C-NMR. This modification in the dynamics can be explained by incipient reactions at the interphase between the homopolymer rich regions, which further evolves to the interior of those phases by the formation of block copolymer of gradually decreasing block length. This process finally produces a random copolymer that forms a single phase with a single segmental relaxation.
Relevant publication: Yes

24 A. Sanz; A. Nogales; I. Puente-Orench; M. Jiménez-Ruiz; T.A. Ezquerra. Detection of early stage precursor during formation of plastic crystal ethanol from the supercooled liquid state: A simultaneous dielectric spectroscopy with neutron diffraction study. Physical Review Letters. 107 - 2, pp. 025502-1 - 025502-4. 2011. Available on-line at: <http://dx.doi.org/10.1103/PhysRevLett.107.025502>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: Yes

Impact source: ISI
Category: PHYSICS, MULTIDISCIPLINARY
Impact index in year of publication: 7.370
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 84

Source of citations: WOS
Citations: 17

Relevant results: Transformation of deuterated ethanol from supercooled liquid into a plastic crystal or rotator phase is investigated by means of a particular experimental setup combining simultaneously dielectric spectroscopy with neutron diffraction techniques.We demonstrate that, previous to the growth of the bcc lattice of the plastic crystal phase, the formation of a precursor or intermediate phase through a liquid-liquid phase separation takes place. Once this precursor phase is formed, subsequent (plastic) crystalline nucleation and growth is expected to develop.
Relevant publication: Yes

25 A. Sanz; D.R. Rueda; T.A. Ezquerra; A. Nogales. Disorder-order transition and nanostructure control in a polystyrene-b-poly (ethyl methacrylate) diblock copolymer. Journal of Nanostructured Polymers and Nanocomposites. 7 - 1, pp. 10 - 17. 2011. Available on-line at: <http://www.jnpn.org/03,07,01,02.html>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 4
Corresponding author: Yes
Impact source: SCOPUS
Impact index in year of publication: 0.153

Source of citations: SCOPUS
Citations: 1

Relevant results: The phase behaviour of a diblock copolymer based on poly(styrene) and poly(ethyl methacrylate) is studied in the weak segregation limit. The unmixing of the blocks into a lamellar morphology takes place during heating and the ordering transition (LDOT) is located around 160 ºC. Fine control of the inter-layers thickness in the lamellar phase is achieved by annealing with time-temperature dependence above the LDOT. The irreversibility of the nanophase separation makes possible the freezing of the layered structure into room temperature. Therefore, we present a simple way to produce a diblock copolymer with a layered structure controlling on demand the size of the inter-layers spacing in a wide range from 35 up to 48 nm.
Relevant publication: Yes

26 M. Hernández; M.A. López-Manchado; A. Sanz; A. Nogales; T.A. Ezquerra. Effects of strain-induced crystallization on the segmental dynamics of vulcanized natural rubber. Macromolecules. 44 - 16, pp. 6574 - 6580. 2011. Available on-line at: <http://dx.doi.org/10.1021/ma201021q>.

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 5.167
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 79

Source of citations: WOS
Citations: 35

Relevant results: The effects of strain-induced crystallization on the segmental dynamics of vulcanized natural rubber (NR) have been studied by combining dielectric relaxation spectroscopy and wide-angle X-ray scattering. Segmental dynamics is clearly affected by uniaxial stretching. For low strains, $\lambda < 3$, stretching takes place without crystallization. However, a dramatic increase of the dielectric strength, $\Delta\varepsilon$, is observed which has been explained by an increase of the effective dipole moment upon stretching. This effect is accompanied by an increment of the fragility parameter, m, since as free volume reduces by stretching more cooperativity is needed in order to accomplish segmental motions. For $3 < \lambda < 7.5$, crystals develop and the inclusion of segments into the crystalline phase counteracts the increment in $\Delta\varepsilon$ provoked by stretching. Our results support a previous morphological model

indicating that during strain-induced crystallization shorter chains are progressively incorporated into the crystals while a significant amount of longer chains remains rather coiled.
Relevant publication: Yes

27 A. Sanz; A. Nogales; T.A. Ezquerra. From hard to soft confinement in a symmetric block copolymer: Local and segmental dynamics. Soft Matter. 7 - 14, pp. 6477 - 6483. 2011. Available on-line at: <http://dx.doi.org/10.1039/c1sm05368j>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 3
Corresponding author: No

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 4.390
Journal in the top 25%: Yes
Position of publication: 27
No. of journals in the cat.: 134

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 4.390
Journal in the top 25%: Yes
Position of publication: 28
No. of journals in the cat.: 232

Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 4.390
Journal in the top 25%: Yes
Position of publication: 7
No. of journals in the cat.: 79

Impact source: ISI
Category: PHYSICS, MULTIDISCIPLINARY
Impact index in year of publication: 4.390
Journal in the top 25%: Yes
Position of publication: 7
No. of journals in the cat.: 84

Source of citations: WOS
Citations: 15

Relevant results: The dynamics of a diblock copolymer in the phase separated lamellar structure and in the mixed state has been studied by dielectric spectroscopy. By choosing a system in which the glass transition temperatures of the two constituent polymers are not very different, we were able to investigate the differences between hard and soft confinement imposed by the more rigid chains. The results indicate that under hard confinement, the segmental dynamics of the low Tg component experiences a slowing down due to interaction with the more rigid chains in both phase separated and mixed cases. For the phase separated case no difference in the dynamics of the low Tg block is observed upon going from the hard to the soft confinement regime. However for the mixed system under soft confinement, i.e. at temperatures higher than the Tg of the more rigid polymer block, a slowing down of the dynamics of the low Tg block polymer towards the dynamics of the more rigid block is clearly evidenced.
Relevant publication: Yes

28 A. Sanz; A. Nogales; T.A. Ezquerra; W. Haeussler; M. Soccio; N. Lotti; A. Munari. Homogeneous dynamics within inhomogeneous environment in semicrystalline polymers. Macromolecules. 44 - 20, pp. 8124 - 8128. 2011. Available on-line at: <http://dx.doi.org/10.1021/ma201304p>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 7
Corresponding author: No

Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 5.167
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 79

Source of citations: WOS
Citations: 11

Relevant results: We show that the combination of dielectric with neutron spin echo measurements performed in a model deuterated polymer as poly(ethylene terephthalate) suggests that the dynamics of semicrystalline polymers occurs in an homogeneous scenario similar to that valid to describe the dynamics of amorphous polymers. Accordingly, the intermolecular cooperativity is expected to be rather similar in both amorphous and semicrystalline polymers. The reduced segmental mobility of the semicrystalline polymer is restricted to well differentiate regions, probably in the crystalamorphous interface. The significant broadening of the dielectric segmental relaxation in semicrystalline polymers can be attributed to the averaging effect of measuring a homogeneous relaxation with similar stretching exponents over an inhomogeneous environment.
Relevant publication: Yes

29 A. Sanz; A. Nogales; T.A. Ezquerra; M. Soccio; A. Munari; N. Lotti. Cold crystallization of poly(trimethylene terephthalate) as revealed by simultaneous WAXS, SAXS, and dielectric spectroscopy. Macromolecules. 43 - 2, pp. 671 - 679. 2010. Available on-line at: <http://dx.doi.org/10.1021/ma902188c>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6
Corresponding author: Yes
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 4.838
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 79
Source of citations: WOS
Citations: 55

Relevant results: This work presents an experimental study on the interplay between structure and dynamics during isothermal and nonisothermal cold crystallization of poly(trimethylene terephthalate). Simultaneous X-ray scattering and dielectric spectroscopy measurements revealed that, during cold crystallization, crystalline lamellae tend to be homogeneously distributed along the sample. A significant amount of rigid amorphous phase is formed during cold crystallization, and its location is assigned to the crystal-amorphous interface. The formation of the rigid amorphous phase during cold crystallization is less effective for poly(trimethylene terephthalate) than for other similar aromatic polyesters like poly(ethylene terephthalate). The mobile amorphous phase, giving rise to the dielectric R relaxation, is mainly located between consecutive crystalline lamellae. The segmental dynamics of the amorphous phase is restricted by the growing crystals during both primary and secondary crystallization.
Relevant publication: Yes

30 H.C. Wong; A. Sanz; J.F. Douglas; J.T. Cabral. Glass formation and stability of polystyrene-fullerene nanocomposites. Journal of Molecular Liquids. 153 - 1, pp. 79 - 87. 2010. Available on-line at: <http://dx.doi.org/10.1016/j.molliq.2009.10.003>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal without external admissions assessment committee
Total no. authors: 4
Corresponding author: No
Impact source: ISI
Category: PHYSICS, ATOMIC, MOLECULAR & CHEMICAL
Impact index in year of publication: 1.649
Journal in the top 25%: No
Position of publication: 18
No. of journals in the cat.: 33

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 1.649
Journal in the top 25%: No
Position of publication: 78
No. of journals in the cat.: 127

Source of citations: WOS
Citations: 50

Relevant results: The addition of nanoparticles (NP) to polymers is particularly interesting from a scientific and practical standpoint as their dimensions are comparable to the dynamic heterogeneity of glass-forming polymer matrices. Such additives can, therefore, potentially change the qualitative character of glass formation rather

than just a change in the glass transition temperature. To gain insight into this phenomenon, we investigate a well characterized and common NP (fullerene nanoparticles whose diameter is approximately 1 nm) dispersed in a common amorphous polymer (polystyrene) by inelastic incoherent neutron scattering, small angle neutron scattering, calorimetric and dielectric spectroscopy methods. We find that the fullerene NP increase the glass transition temperature, slowing down the alpha relaxation dynamics associated with glass formation, while at the same time cause a softening of the material at high frequencies (as determined by the Debye–Waller factor). These effects are interpreted in terms of the particle modifying the polymer packing, causing an increase of the fragility of glass formation. Recent molecular dynamics simulations and experimental studies confirm that NP with attractive interactions for the polymer matrix should indeed increase the fragility of glass formation. Our measurements, in combination with previous work, demonstrate that that the fragility of glass formation can be tuned through the judicious choice of NP, an effect which has numerous implications for the mechanical properties, permeability and other basic properties of polymer nanocomposites.
Relevant publication: Yes

31 A. Sanz; A. Nogales; T.A. Ezquerra. Influence of Fragility on Polymer Cold Crystallization. Macromolecules. 43 - 1, pp. 29 - 32. 2010. Available on-line at: <http://dx.doi.org/10.1021/ma902289k>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 3
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 4.838
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 79
Source of citations: WOS
Citations: 19

Relevant results: Here we have shown that there is a correlation between nucleation kinetics and dynamic fragility when the crystallization process takes place in the proximity of the glass transition temperature.
Relevant publication: Yes

32 A Sanz; Tiberio A Ezquerra; A Nogales. Interplay between amorphous and crystalline domains in semicrystalline polymers by simultaneous {SAXS}, {WAXS} and Dielectric Spectroscopy. {IOP} Conference Series: Materials Science and Engineering. 14, pp. 012011 - 012011. {IOP} Publishing, 2010. Available on-line at: <https://doi.org/10.1088%2F1757-899x%2F14%2F1%2F012011>.

Type of production: Scientific paper
Format: Journal
Source of citations: WOS
Citations: 1

Relevant publication: Yes

33 J. Carretero-González; T.A. Ezquerra; S. Amnuaypornsri; S. Toki; R. Verdejo; A. Sanz; J. Sakdapipanich; B.S. Hsiao; M.A. López-Manchado. Molecular dynamics of natural rubber as revealed by dielectric spectroscopy: The role of natural cross-linking. Soft Matter. 6 - 15, pp. 3636 - 3642. 2010. Available on-line at: <http://dx.doi.org/10.1039/c003087b>.

Type of production: Scientific paper
Format: Journal
Position of signature: 7
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 9
Corresponding author: No
Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 4.457
Journal in the top 25%: Yes
Position of publication: 23
No. of journals in the cat.: 225

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 4.457
Journal in the top 25%: Yes
Position of publication: 28
No. of journals in the cat.: 127

Impact source: ISI
Impact index in year of publication: 4.457
Position of publication: 6
Category: POLYMER SCIENCE
Journal in the top 25%: Yes
No. of journals in the cat.: 79

Impact source: ISI
Impact index in year of publication: 4.457
Position of publication: 7
Category: PHYSICS, MULTIDISCIPLINARY
Journal in the top 25%: Yes
No. of journals in the cat.: 80

Source of citations: WOS
Citations: 28

Relevant results: In order to understand the molecular dynamics of natural rubber, the dielectric relaxation behavior of its different components were investigated. These components included: (1) the linear polyisoprene fraction, obtained after deproteinization and transesterification of natural rubber (TE–DPNR), (2) the gel (GEL) fraction, corresponding to pure natural chain–end cross–linked natural rubber, (3) deproteinized natural rubber (DPNR), in which the protein cross–links at the u–end have been removed, and (4) natural rubber (CNR) purified (through centrifugation) but still containing proteins, phospholipids and the sol phases. The dielectric relaxation behaviour of natural rubber revealed a segmental mode (SM) which is not affected by natural chain-end cross-linking (so-called naturally occurring network) and a normal mode (NM) which depends on a naturally occurring network. The dynamics of the NM, which is associated to chain mobility, seems to be strongly affected by natural chain-end cross-linking. We propose a model based on a hybrid star polymer in which the low mobility core (phospholipids) controls the mobility of the polyisoprene arms.
Relevant publication: Yes

34 A. Linares; A. Nogales; A. Sanz; T.A. Ezquerra; M. Pieruccini. Restricted dynamics in oriented semicrystalline polymers: Poly(vinilydene fluoride). Physical Review E - Statistical, Nonlinear, and Soft Matter Physics. 82 - 3, pp. 031802-1 - 031802-11. 2010. Available on-line at: <http://dx.doi.org/10.1103/PhysRevE.82.031802>.

Type of production: Scientific paper
Format: Journal
Position of signature: 3
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No

Impact source: ISI
Impact index in year of publication: 2.352
Position of publication: 4
Category: PHYSICS, MATHEMATICAL
Journal in the top 25%: Yes
No. of journals in the cat.: 54

Impact source: ISI
Impact index in year of publication: 2.352
Position of publication: 8
Category: PHYSICS, FLUIDS & PLASMAS
Journal in the top 25%: No
No. of journals in the cat.: 31

Source of citations: WOS
Citations: 10

Relevant results: The effect of confinement by crystals on the relaxation, observed by dielectric broadband spectroscopy, in isotropic as well as in oriented semicrystalline polyvinilydene fluoride, is analyzed on the basis of a new thermodynamic model. In both samples, it has been found that the average free-energy barrier, F, for conformational rearrangements is of the same order of the dispersion barrier heights, F, around F, i.e., the increase in the barrier height in conformational rearrangement is accompanied by an increase in the heterogeneity of constraining conditions. At a given temperature T, the readjustment free energy is larger in the oriented sample. This fact might be ascribed to either an enhanced effectiveness of confinement in the amorphous region due to the decrease of the amorphous layer thickness in the stacks, or to a change of the mean chain orientation or both. In addition, it is worth noting that in oriented polyvinilydene fluoride the regions of cooperative rearrangement are significantly larger. Moreover, independent of orientation, the size of these readjusting regions increase upon decreasing T. This feature, which underlies the Adam-Gibbs approach for liquids, is pointed out for the first time from direct data analysis in the case of confinement enhanced cooperativity. In addition to the above analysis, the samples have been characterized by differential scanning calorimetry, wide angle x-ray scattering, and small angle x-ray scattering.
Relevant publication: Yes

35 M.D. Ninago; A.J. Satti; A.E. Ciolino; E.M. Vallés; M.A. Villar; D.A. Vega; A. Sanz; A. Nogales; D.R. Rueda. Synthesis and morphology of model PS-b-PDMS copolymers. Journal of Polymer Science, Part A: Polymer Chemistry. 48 - 14, pp. 3119 - 3127. 2010. Available on-line at: <http://dx.doi.org/10.1002/pola.24093>.

Type of production: Scientific paper
Format: Journal
Position of signature: 7
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 9
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 3.894
Journal in the top 25%: Yes
Position of publication: 8
No. of journals in the cat.: 79
Source of citations: WOS
Citations: 16

Relevant results: True model linear poly(styrene-b-dimethylsiloxane) PS-b-PDMS copolymers were synthesized by using sequential addition of monomers and anionic polymerization (high-vacuum techniques), employing the most recent experimental procedures that allow the controlled polymerization of each monomer to obtain blocks with controlled molar masses. The model diblock copolymers obtained were analyzed by using different techniques, such as size-exclusion chromatography, 1H NMR, Fourier transform infrared spectroscopy, small angle X-rays scattering (SAXS), and wide angle X-rays scattering (WAXS). The PS-b- PDMS copolymers obtained showed narrow molar mass distribution and variable PDMS content, ranging from 2 up to 55 wt %. Compacted powder samples were investigated by SAXS to reveal their structure and morphology changes on thermal treatment in the interval from 30 to 200 C. The sample with the highest PDMS content exhibits a lamellar morphology, whereas two other samples show hexagonally packed cylinders of PDMS in a PS matrix. For the lowest PDMS content samples, the SAXS pattern corresponds to a disordered morphology and did not show any changes on thermal treatment. Detailed information about the morphology of scattering domains was obtained by fitting the SAXS scattering curves. V
Relevant publication: Yes

36 J. Martín; C. Mijangos; A. Sanz; T.A. Ezquerra; A. Nogales. Segmental dynamics of semicrystalline poly(Vinylidene Fluoride) nanorods. Macromolecules. 42 - 14, pp. 5395 - 5401. 2009. Available on-line at: <http://dx.doi.org/10.1021/ma900754v>.

Type of production: Scientific paper
Format: Journal
Position of signature: 4
Degree of contribution: Author or co-author of article in journal without external admissions assessment committee
Total no. authors: 6
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 4.539
Journal in the top 25%: Yes
Position of publication: 5
No. of journals in the cat.: 76
Source of citations: WOS
Citations: 74

Relevant results: The dynamics of a semicrystalline poly(vinylidene fluoride) (PVDF) confined within alumina templates of cylindrical nanopores is studied by means of dielectric spectroscopy. In this study we demonstrate how the counterbalance between spatial confinement and interfacial interactions controls at the nanometer level the dynamic and semicrystalline structure of the polymer. A strong deviation of the relaxation behavior of PVDF embedded within the nanopores is observed as compared to that of the bulk. In particular, the dielectric measurements reveal, for pore sizes of the order of 20 nm, the existence of a highly constrained relaxation associated with the polymer-alumina interfacial layer.
Relevant publication: Yes

37 A. Sanz; M. Ruppel; J.F. Douglas; J.T. Cabral. Plasticization effect of C 60 on the fast dynamics of polystyrene and related polymers: An incoherent neutron scattering study. Journal of Physics Condensed Matter. 20 - 10, pp. 104209-1 - 104209-7. 2008. Available on-line at: <http://dx.doi.org/10.1088/0953-8984/20/10/104209>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1

Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 4
Corresponding author: No
Impact source: ISI
Category: PHYSICS, CONDENSED MATTER
Impact index in year of publication: 1.900
Journal in the top 25%: No
Position of publication: 17
No. of journals in the cat.: 62
Source of citations: WOS
Citations: 38

Relevant results: We utilize inelastic incoherent neutron scattering (INS) to quantify how fullerenes affect the 'fast' molecular dynamics of a family of polystyrene related macromolecules. In particular, we prepared bulk nanocomposites of (hydrogenous and ring-deuterated) polystyrene and poly(4-methyl styrene) using a rapid precipitation method where the C60 relative mass fraction ranged from 0% to 4%. Elastic window scan measurements, using a high resolution (0.9 μeV) backscattering spectrometer, are reported over a wide temperature range (2–450 K). Apparent Debye–Waller (DW) factors u2, characterizing the mean-square amplitude of proton displacements, are determined as a function of temperature, T . We find that the addition of C60 to these polymers leads to a progressive increase in u2 relative to the pure polymer value over the entire temperature range investigated, where the effect is larger for larger nanoparticle concentration. This general trend seems to indicate that the C60 nanoparticles plasticize the fast (≈10−15 s) local (≈1 A°) dynamics of these polymer glasses. Generally, we expect nanoparticle additives to affect polymer dynamics in a similar fashion to thin films in the sense that the high interfacial area may cause both a speeding up and slowing down of the glass state dynamics depending on the polymer–surface interaction.
Relevant publication: Yes

38 Aurora Nogales; Daniel R. Rueda; Alejandro Sanz; Mari-Cruz García-Gutiérrez; Tiberio A. Ezquerra; Mikhail G. Zolotukhin; M. del Carmen G. Hernández; Sergei Fomine; Howard M. Colquhoun. Characterization of the Layered Structure in Main Chain Dibenzo-18-crown-6 Ether Polymers by Simultaneous WAXS/MAXS−SAXS/DSC Measurements. Macromolecules. 40 - 9, pp. 3355 - 3360. ACS Publications, 2007. Available on-line at: <https://doi.org/10.1021/ma0701336>.
Type of production: Scientific paper
Format: Journal
Corresponding author: No
Impact source: ISI
Impact index in year of publication: 4.411
Source of citations: WOS
Citations: 2
Relevant publication: Yes

39 A. Sanz; A. Nogales; N. Lotti; A. Munari; T.A. Ezquerra. Complex nature of the β relaxation and fragility in aromatic polyesters. Journal of Non-Crystalline Solids. 353 - 41, pp. 3989 - 3995. 2007. Available on-line at: <http://www.sciencedirect.com/science/article/pii/S0022309307007740>. ISSN 0022-3093
Type of production: Scientific paper
Format: Journal
Impact source: ISI
Impact index in year of publication: 1.319
Source of citations: WOS
Citations: 6
Relevant publication: Yes

40 J.J. Hernández; M.C. García Gutiérrez; A. Nogales; D.R. Rueda; A. Sanz; I. Sics; B.S. Hsiao; Z. Roslaniec; G. Broza; T.A. Ezquerra. Deformation behaviour during cold drawing of nanocomposites based on single wall carbon nanotubes and poly(ether ester) copolymers. Polymer. 48 - 11, pp. 3286 - 3293. 2007. Available on-line at: <http://dx.doi.org/10.1016/j.polymer.2007.03.070>.
Type of production: Scientific paper
Format: Journal
Position of signature: 5
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 10
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 3.065
Journal in the top 25%: Yes
Position of publication: 9
No. of journals in the cat.: 74

Source of citations: WOS
Citations: 24

Relevant results: Relationships between the macroscopic deformation behaviour and microstructure of a pure (PBT-b-PTMO) block copolymer and a polymer nanocomposite (PBT-b-PTMO þ 0.2 wt% SWCNT) were investigated by simultaneous small- and wide-angle X-ray scattering (SAXS and WAXS) during tensile deformation using synchrotron radiation. The Young's modulus was found to be 15% higher for the nanocomposite than for the pure block copolymer as well as the yield strength, while the elongation-to-break was less than a half. This different behaviour can be explained by taking into account the different structural features revealed by SAXS and WAXS and thus considering that SWCNT act as anchors in the nanocomposite, sharing the applied stress with the PBT crystals and partially preventing the flexible, non-crystallisable PTMO chains to elongate.
Relevant publication: Yes

41 A. Nogales; A. Sanz; T.A. Ezquerra; R. Quintana; S. Muñoz-Guerra. Molecular dynamics of poly(butylene tert-butyl isophthalate) and its copolymers with poly(butylene terephthalate) as revealed by broadband dielectric spectroscopy. Polymer. 47 - 20, pp. 7078 - 7084. 2006. Available on-line at: <http://dx.doi.org/10.1016/j.polymer.2006.07.044>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 2.773
Journal in the top 25%: Yes
Position of publication: 9
No. of journals in the cat.: 75

Source of citations: WOS
Citations: 5

Relevant results: The dynamic behaviour of a set of copolyesters made of 1,4-butanediol, terephthalic acid and 5-tert-butyl isophthalic acid, as well as the two parent homopolymers was studied. Although the insertion of the tert-butyl isophthalate units in the main chain of poly(butylene terephthalate) modified the glass transition, the beta relaxation did not change dramatically. By using broadband dielectric spectroscopy we have obtained a detailed picture of the dynamic behaviour of these systems. In all cases, a strong correlation between the alpha relaxation and the b relaxation above Tg was observed in accordance with recent proposals based on the coupling model.
Relevant publication: Yes

42 A. Nogales; A. Sanz; T.A. Ezquerra. On the role of the beta process as precursor of the alpha relaxation in aromatic polyesters. Journal of Non-Crystalline Solids. 352 - 42-49 SPEC. ISS., pp. 4649 - 4655. 2006. Available on-line at: <http://dx.doi.org/10.1016/j.jnoncrysol.2006.02.141>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee

Total no. authors: 3
Corresponding author: No
Impact source: ISI
Category: MATERIALS SCIENCE, CERAMICS
Impact index in year of publication: 1.362
Journal in the top 25%: Yes
Position of publication: 4
No. of journals in the cat.: 26

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 1.362
Journal in the top 25%: No
Position of publication: 59
No. of journals in the cat.: 176

Source of citations: WOS
Citations: 24

Relevant results: By performing broad band dielectric spectroscopy measurements in a series of amorphous aromatic polyesters we show that different fast modes, contributing to the b relaxation, appear at temperatures below the glass transition temperature, Tg. At high temperatures, (T > Tg) the different b modes tend to merge and the data have to be described by a single b peak. We tentatively assign a molecular origin to each of the different b modes. But also we find a strong connection among the merged b processes and the precursor of the structural a relaxation, implying that this relaxation may posses an important degree of intra-segmental cooperativity.
Relevant publication: Yes

43 A. Sanz; A. Nogales; T.A. Ezquerra; N. Lotti; A. Munari; S.S. Funari. Order and segmental mobility during polymer crystallization: Poly(butylene isophthalate). Polymer. 47 - 4, pp. 1281 - 1290. 2006. Available on-line at: <http://dx.doi.org/10.1016/j.polymer.2005.12.047>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 6
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 2.773
Journal in the top 25%: Yes
Position of publication: 9
No. of journals in the cat.: 75

Source of citations: WOS
Citations: 41

Relevant results: The influence of the development of crystalline structure on the segmental dynamics of the amorphous phase in poly(butylene isophthalate) (PBI) has been studied by a combination of relaxation and scattering techniques. By means of dielectric spectroscopy (DS) the dynamics of both amorphous and semicrystalline PBI samples has been observed in a wide frequency and temperature range. The evolution of the crystalline phase with time has been studied in a range of temperatures, starting from initially glassy PBI by simultaneous small and wide angle X-ray scattering (SWAXS). By using a state-of-the-art setup designed specifically for the in situ study of both DS and SWAXS simultaneously (SWD), the crystallization of initially amorphous PBI has been followed in real time from both the structural and dynamics points of view. The obtained results support a model based on two different regimes on crystallization and a heterogeneous distribution of lamellar stacks. During the first regime the primary stacks cause the apparition of a rigid amorphous phase (RAP), i.e. a phase of amorphous chains lacking segmental motion. During the second regime, however, no more RAP is observed, indicating that the new lamellae that appear during this stage are nearly individual and not forming lamella stacks.
Relevant publication: Yes

44 C. Álvarez; A. Nogales; M.C. García Gutiérrez; A. Sanz; Z. Denchev; S.S. Funari; M. Bruix; T.A. Ezquerra. Confined crystallization in phase-separated poly(ethylene terephthalate)/poly(ethylene naphthalene 2,6-dicarboxilate) blends. European Physical Journal E. 18 - 4, pp. 459 - 465. 2005. Available on-line at: <http://dx.doi.org/10.1140/epje/e2005-00045-6>.

Type of production: Scientific paper
Format: Journal
Position of signature: 4
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: POLYMER SCIENCE
Impact index in year of publication: 2.503
Journal in the top 25%: Yes
Position of publication: 10
No. of journals in the cat.: 77

Impact source: ISI
Category: PHYSICS, APPLIED
Impact index in year of publication: 2.503
Journal in the top 25%: Yes
Position of publication: 11
No. of journals in the cat.: 83

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 2.503
Journal in the top 25%: Yes

Position of publication: 22
No. of journals in the cat.: 178

Impact source: ISI
Category: CHEMISTRY, PHYSICAL
Impact index in year of publication: 2.503
Journal in the top 25%: No
Position of publication: 31
No. of journals in the cat.: 111

Source of citations: WOS
Citations: 7

Relevant publication: Yes

45 M. Jiménez-Ruiz; A. Sanz; A. Nogales; T.A. Ezquerra. Experimental setup for simultaneous measurements of neutron diffraction and dielectric spectroscopy during crystallization of liquids. Review of Scientific Instruments. 76 - 4, pp. 043901-1 - 043901-4. 2005. Available on-line at: <http://dx.doi.org/10.1063/1.1876992>.

Type of production: Scientific paper
Format: Journal
Position of signature: 2
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 4
Corresponding author: No

Impact source: ISI
Category: INSTRUMENTS & INSTRUMENTATION
Impact index in year of publication: 1.235
Journal in the top 25%: Yes
Position of publication: 12
No. of journals in the cat.: 52

Impact source: ISI
Category: PHYSICS, APPLIED
Impact index in year of publication: 1.235
Journal in the top 25%: No
Position of publication: 37
No. of journals in the cat.: 83

Source of citations: WOS
Citations: 8

Relevant results: Here we present an experimental setup to obtain information on structural and dynamical changes in liquids during crystallization. This setup consists in a sample cell that allows performing simultaneous measurements of neutron diffraction and dielectric spectroscopy experiments. The capabilities of the technique have been probed by following in real time the crystallization process of a model liquid: the isopropanol. By performing these experiments simultaneously, information can be obtained from both phases, amorphous and crystalline, and therefore it can provide a complete description of the changes occurring during a crystallization process. The use of this setup allowed us to demonstrate that a breakage of the hydrogen-bond network is a precursor step for the crystallization of isopropanol.
Relevant publication: Yes

46 A. Sanz; D.R. Rueda; A. Nogales; M. Jiménez-Ruiz; T.A. Ezquerra. Molecular dynamics in crystalline acetone studied by dielectric spectroscopy and neutron diffraction. Physica B: Condensed Matter. 370 - 1-4, pp. 22 - 28. 2005. Available on-line at: <http://dx.doi.org/10.1016/j.physb.2005.08.031>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: Yes

Impact source: ISI
Category: PHYSICS, CONDENSED MATTER
Impact index in year of publication: 0.796
Journal in the top 25%: No
Position of publication: 37
No. of journals in the cat.: 60

Source of citations: WOS
Citations: 3

Relevant results: Dielectric spectroscopy and neutron diffraction experiments in acetone have been performed in order to clarify the dynamical behavior and the structural changes associated to the unsolved thermal transition that takes place in the solid state around 130 K. The combination of dielectric experiments with neutron diffraction reveals the existence of a dielectric process in the stable crystalline phase of acetone. The evolution with temperature of the dielectric process, within the temperature range where the peak of the heat capacity was reported, supports that the transition is not of order–disorder type. The origin of the dielectric dispersion has been assigned to structural defects in the orthorhombic crystal phase of acetone.

Relevant publication: Yes

47 T.A. Ezquerra; A. Martínez-Gómez; C. Álvarez; E. Alonso; A. Sanz; M.C. García Gutiérrez; A. Bello; E. Pérez; S.S. Funari; M. Dommach. Structure-dynamics relationship during the amorphous to smectic transition of a main chain liquid crystalline polymer. Journal of Non-Crystalline Solids. 351 - 33-36 SPEC. ISS., pp. 2768 - 2772. 2005. Available on-line at: <http://dx.doi.org/10.1016/j.jnoncrysol.2005.03.073>.

Type of production: Scientific paper
Format: Journal
Position of signature: 5
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 10
Corresponding author: No
Impact source: ISI
Category: MATERIALS SCIENCE, CERAMICS
Impact index in year of publication: 1.264
Journal in the top 25%: Yes
Position of publication: 3
No. of journals in the cat.: 28

Impact source: ISI
Category: MATERIALS SCIENCE, MULTIDISCIPLINARY
Impact index in year of publication: 1.264
Journal in the top 25%: No
Position of publication: 59
No. of journals in the cat.: 178

Source of citations: WOS
Citations: 3

Relevant results: The isothermal amorphous to smectic phase transformation of a polybibenzoate was investigated by simultaneous medium- and wide-angle X-ray scattering (MAXS and WAXS) and dielectric spectroscopy (DS). By this experimental approach, simultaneously collected information was obtained about the specific changes occurring in both amorphous and smectic phases during the transformation. The main experimental features can be explained assuming a transformation mechanism involving the initial growth of smectic domains, during a primary time period, and the improvement of order in the smectic domains during a secondary time regime.
Relevant publication: Yes

48 A. Sanz; A. Nogales; T.A. Ezquerra; N. Lotti; L. Finelli. Cooperativity of the beta relaxations in aromatic polymers. Physical Review E - Statistical, Nonlinear, and Soft Matter Physics. 70 - 2 1, pp. 021502 - 6. 2004. Available on-line at: <http://dx.doi.org/10.1103/PhysRevE.70.021502>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: Science Edition - PHYSICS, MATHEMATICAL
Impact index in year of publication: 2.352
Journal in the top 25%: Yes
Position of publication: 2
No. of journals in the cat.: 34

Impact source: ISI
Category: PHYSICS, FLUIDS & PLASMAS
Impact index in year of publication: 2.352
Journal in the top 25%: Yes
Position of publication: 3
No. of journals in the cat.: 21

Source of citations: WOS
Citations: 19

Relevant results: The dielectric loss spectra of a series of copolyesters of poly(ethylene terephthalate) and poly(ethylene isophthalate) have been measured as a function of temperature in a broad frequency range s10−1–109 Hzd. By these measurements, the merging of the two relevant relaxations a and b has been studied. The b processes exhibit a complex temperature dependence, showing a clear Arrhenius dependence at temperatures well below the glass transition temperature, a transition zone where the characteristic relaxation time of this process nearly does not change with temperature, and an Arrhenius behavior with a higher activation energy for temperatures above the glass transition. The analysis of these results indicates that the b relaxation in these systems presents typical characteristics of a genuine Johari-Goldstein process. This finding has been interpreted

as due to the full monomer extension of the molecular motions involved in the b relaxation in agreement with recent proposals.
Relevant publication: Yes

49 A. Sanz; M. Jiménez-Ruiz; A. Nogales; D. Martín y Marero; T.A. Ezquerra. Hydrogen-bond network breakage as a first step to isopropanol crystallization. Physical Review Letters. 93 - 1, pp. 015503-1 - 015503-4. 2004. Available on-line at: <http://dx.doi.org/10.1103/PhysRevLett.93.015503>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5
Corresponding author: No
Impact source: ISI
Category: PHYSICS, MULTIDISCIPLINARY
Impact index in year of publication: 7.218
Journal in the top 25%: Yes
Position of publication: 4
No. of journals in the cat.: 67
Source of citations: WOS
Citations: 25

Relevant results: Here we present an experimental study of isopropanol crystallization in real time by means of a novel setup combining simultaneously structural measurements with dynamical techniques. By coupling time resolved neutron diffraction and dielectric spectroscopy experiments we demonstrate that a breakage of the hydrogen-bond network is a precursor step for the crystallization of isopropanol.
Relevant publication: Yes

50 A. Nogales; G. Broza; Z. Roslaniec; K. Schulte; I. Sics; B.S. Hsiao; A. Sanz; M.C. García Gutiérrez; D.R. Rueda; C. Domingo; T.A. Ezquerra. Low Percolation Threshold in Nanocomposites Based on Oxidized Single Wall Carbon Nanotubes and Poly(butylene terephthalate). Macromolecules. 37 - 20, pp. 7669 - 7672. 2004. Available on-line at: <http://dx.doi.org/10.1021/ma049440r>.

Type of production: Scientific paper
Format: Journal
Position of signature: 7
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 11
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE
Impact index in year of publication: 3.898
Journal in the top 25%: Yes
Position of publication: 3
No. of journals in the cat.: 75
Source of citations: WOS
Citations: 187

Relevant results: To achieve low percolation thresholds in single wall carbon nanotube (SWCNT) and thermoplastic poly(butylene terephthalate) (PBT) composites, we have used an in situ polycondensation reaction process. The intense dispersion process achieved first by ultrasonication and followed by ultrahigh speed stirring of single wall nanotubes in 1,4-butanediol and the subsequent in situ polycondensation has made possible the preparation of nanocomposites in which the percolation threshold is around 0.2 wt % of SWCNT. This relatively low value approaches those reported for carbon nanotube nanocomposites based on thermoset polymers. On the basis of the structural measurements, we interpret that agglomeration effects may enhance the formation of the conducting network.
Relevant publication: Yes

51 A. Sanz; F. Mendicuti. Excimers in dilute solutions of N-vinyl carbazole/styrene copolymers of different molar compositions. Polymer. 43 - 23, pp. 6123 - 6130. 2002. Available on-line at: <http://dx.doi.org/10.1016/S0032-3861(02)00584-0>.

Type of production: Scientific paper
Format: Journal
Position of signature: 1
Degree of contribution: Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 2
Corresponding author: No
Impact source: ISI
Category: Science Edition - POLYMER SCIENCE

Impact index in year of publication: 1.838
Position of publication: 8

Source of citations: WOS **Citations:** 17

Relevant results: Steady-state fluorescence for dilute solutions of poly(N-vinyl carbazole) and N-vinyl carbazole/styrene copolymers of different molar monomer compositions upon excitation of carbazole groups were performed. IE/IM ratios depend on solvent nature, emission wavelength and copolymer composition. Molecular dynamics simulations on pure isotactic and sindiotactic fragments of different monomer compositions were used for identifying the amount and the conformations capable of forming intramolecular excimers. The analysis of theoretical results interprets the variation of the amount of intramolecular excimer with the molar monomer content. Types of complexes by total or partial overlapping between adjacent and non-adjacent carbazole chromophores were also distinguished.
Relevant publication: Yes

52 Daniel E. Martínez-Tong; Alejandro Sanz; Jaime Martín; TiberioA. Ezquerra; Aurora Nogales. Non-equilibrium Structure Affects Ferroelectric Behavior of Confined Polymers. Non-equilibrium Phenomena in Confined Soft Matter. pp. 189 - 206. Springer International Publishing, 2015. Available on-line at: <http://dx.doi.org/10.1007/978-3-319-21948-6_8>. ISBN 978-3-319-21947-9

Type of production: Book chapter **Format:** Book
Position of signature: 2 **Degree of contribution:** Author or co-author of article in journal with external admissions assessment committee
Total no. authors: 5 **Corresponding author:** No
Source of citations: WOS **Citations:** 1

Relevant results: The effect of interfacial interactions and finite size effects in polymer ferroelectric structures is discussed. The comparison of results on confinement in different geometries demonstrates that the presence of interfaces with a solid wall can stabilize a ferroelectric phase not otherwise spontaneously formed under normal bulk processing conditions.
Relevant publication: Yes

53 A. Nogales; A. Sanz; I. Sics; M.C. García Gutiérrez; T.A. Ezquerra. Order and segmental mobility in crystallizing polymers. Lecture Notes in Physics. 714, pp. 435 - 456. Springer Berlin Heidelberg, 2007. Available on-line at: <http://dx.doi.org/10.1007/3-540-47307-6_21>.

Type of production: Book chapter **Format:** Book
Position of signature: 2 **Degree of contribution:** Author or co-author of chapter in book
Total no. authors: 5 **Corresponding author:** No
Impact source: SCOPUS
Impact index in year of publication: 0.207

Source of citations: SCOPUS **Citations:** 2

Relevant results: The simultaneous combination of scattering techniques, probing structure, with relaxation techniques, detecting modifications of the amorphous phase dynamics, can be helpful in order to obtain complementary information about crystallization processes in polar polymers. The objective of this contribution is to review the improvements in the combination of real time (wide and small angle) X-ray scattering and dielectric spectroscopy aiming at a better understanding of polymer crystallization
Relevant publication: Yes

54 Alejandro Sanz; Henriette W. Hansen; Bo Jakobsen; Ib H. Pedersen; Kristine Niss; Simone Capaccioli; Karolina Adrjanowicz; Marian Paluch; Julien Gonthier; Bernhard Frick; Judith Peters; Eddy Lelièvre-Berna. Dynamics in pressure-temperature space by coupling dielectric and neutron spectroscopy: a new experimental tool. Annual Report 2017, Scientific Highlights (Technical and computing developments) of the Institut Laue Langevin.pp. 84 - 85. 2017. Available on-line at: <http://cdn.frm2.tum.de/fileadmin/stuff/information/documents/annualReports/Annual_Report_2011_online_version.pdf>.

Type of production: Scientific-technical report
Position of signature: 1
Format: Scientific and technical document or report
Degree of contribution: Author or co-author of scientific or technical document for the general public

Total no. authors: 4
Relevant publication: Yes

55 Henriette W. Hansen; Alejandro Sanz; Kristine Niss; Karolina Adrjanowicz; Bernhard Frick. One-dimensional phase diagram for simple glass formers. Annual Report 2017, Scientific Highlights (Technical and computing developments) of the Institut Laue Langevin.pp. 62 - 63. 2017. Available on-line at: <http://cdn.frm2.tum.de/fileadmin/stuff/information/documents/annualReports/Annual_Report_2011_online_version.pdf>.

Type of production: Scientific-technical report
Position of signature: 1
Format: Scientific and technical document or report
Degree of contribution: Author or co-author of scientific or technical document for the general public

Total no. authors: 4
Relevant publication: Yes

56 Alejandro Sanz; Wolfwang Haeussler; Aurora Nogales; Tiberio A. Ezquerra. The alpha relaxation dynamics of a pure semicrystalline polymer studied using spin echo. Annual Report 2011 Forschungs-Neutronenquelle; Heinz Maier-Leibnitz (FRM II). pp. 36 - 37. 2011. Available on-line at: <http://cdn.frm2.tum.de/fileadmin/stuff/information/documents/annualReports/Annual_Report_2011_online_version.pdf>.

Type of production: Scientific-technical report
Position of signature: 1
Format: Scientific and technical document or report
Degree of contribution: Author or co-author of scientific or technical document for the general public

Total no. authors: 4
Relevant publication: Yes

57 Alejandro Sanz; Mónica Jiménez Ruiz; Aurora Nogales; Tiberio A. Ezquerra. Hydrogen-bond network breakage as a first step to isopropanol crystallisation. Annual Report 2004, Scientific Highlights (Chemistry) of the Institut Laue Langevin. pp. 34 - 35. Institut Laue Langevin, 2004. Available on-line at: <http://www.ill.eu/fileadmin/users_files/Annual_Report/AR-04/page/index.htm?rub=3_3&ssp=4>.

Type of production: Scientific-technical report
Position of signature: 1
Format: Scientific and technical document or report
Degree of contribution: Author or co-author of scientific or technical document for the general public

Total no. authors: 4
Corresponding author: No
Relevant publication: Yes

Works submitted to national or international conferences

1 **Title of the work:** Experimental evidence for a state-point dependent density-scaling exponent of liquid dynamics
Name of the conference: XV International Workshop on Complex Systems
Type of event: Conference
Type of participation: Participatory - oral communication
City of event: Andalo, Italy
Date of event: 17/03/2019
End date: 20/03/2019
Organising entity: Università di Trento

2 **Title of the work:** Simultaneous dielectric and scattering techniques in the temperature-pressure plane
Name of the conference: 10th Conference on Broadband Dielectric Spectroscopy and its Applications
Type of event: Conference

Type of participation: Participatory - invited/keynote talk
City of event: Bruselas, Belgium
Date of event: 26/08/2018
End date: 31/08/2018
Organising entity: Universidad Libre de Bruselas

3 **Title of the work:** Pressure densification of 5-poly-phenyl-ether studied in different dielectric cells
Name of the conference: Viscous liquids and the glass transition. XV. International workshop
Type of event: Seminar **Geographical area:** European Union
Type of participation: Participatory - invited/keynote talk **Reasons for participation:** Upon invitation
City of event: Holbæk, Denmark
Date of event: 21/06/2018
End date: 23/06/2018
Organising entity: Glass and Time Group, Dep. of Sciences, Roskilde University **Type of entity:** University Department
Alejandro Sanz; Kristine Niss.

4 **Title of the work:** Liquid dynamics during nucleation and crystal growth in a hydrogen-bonded liquid
Name of the conference: 8th International Discussion Meeting on Relaxations in Complex Systems
Type of event: Conference
Type of participation: Participatory - invited/keynote talk **Reasons for participation:** Upon invitation
City of event: Wisla, Poland
Date of event: 23/07/2017
End date: 29/07/2017
Organising entity: Institute of Physics, University of Silesia

5 **Title of the work:** Development of high-pressure cell for simultaneous dielectric and neutron spectroscopy
Name of the conference: Strategy Meeting for High Pressure Spallation Science
Type of event: Workshop
Type of participation: Participatory - oral communication
City of event: Lund, Sweden
Date of event: 06/07/2017
End date: 07/07/2017
Organising entity: ESS Neutron Source

6 **Title of the work:** High pressure cell for simultaneous neutron scattering and dielectric spectroscopy
Name of the conference: 50 years of neutron backscattering. International workshop
Type of event: Seminar **Geographical area:** European Union
Type of participation: Participatory - oral communication
City of event: Garching, Germany
Date of event: 02/09/2016
End date: 03/09/2016
Organising entity: ILL, ISIS y MLZ
Alejandro Sanz; Kristine Niss.

7 **Title of the work:** Ordering mechanisms and self-confining effects during crystallization
Name of the conference: Viscous liquids and the glass transition. XIV. International workshop
Type of event: Seminar **Geographical area:** European Union
Type of participation: Participatory - invited/keynote talk

City of event: Holbæk, Denmark
Date of event: 16/06/2016
End date: 18/06/2016
Organising entity: Glass and Time Group, Dep. of Sciences, Roskilde University **Type of entity:** University Department
Alejandro Sanz; Kristine Niss.

8 **Title of the work:** Setups for combining dielectric spectroscopy and scattering techniques: implications in glass forming systems
Name of the conference: 6th International Conference on Synchrotron Radiation in Polymer Science
Type of event: Conference **Geographical area:** Non EU International
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: Madrid, Community of Madrid, Spain
Date of event: 07/09/2015
End date: 10/09/2015
Organising entity: Instituto de Estructura de la Materia, IEM-CSIC **Type of entity:** State agency
Type of contribution: Scientific paper
Alejandro Sanz; Kristine Niss.

9 **Title of the work:** Self-confined dynamics in supercooled liquids during crystallization
Name of the conference: Viscous liquids and the glass transition. XIII. International workshop
Type of event: Seminar **Geographical area:** European Union
Type of participation: 'Participatory - poster
City of event: Holbæk, Denmark
Date of event: 28/05/2015
End date: 30/05/2015
Organising entity: Glass and Time Group, Dep. of Sciences, Roskilde University **Type of entity:** University Department
Type of contribution: Scientific paper
Alejandro Sanz; Kristine Niss.

10 **Title of the work:** Self-confined dynamics in supercooled liquids during crystallization
Name of the conference: APS March Meeting
Type of event: Conference **Geographical area:** Non EU International
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: San Antonio, United States of America
Date of event: 05/03/2015
End date: 06/03/2015
Organising entity: American Physical Society
Type of contribution: Scientific paper
Alejandro Sanz; Kristine Niss; Aurora Nogales; TIberio A Ezquerra; Monica Jimenez; Ines Puente-Orench.

11 **Title of the work:** Isopropanol reorientation dynamics in the liquid, supercooled and partially crystalline state
Name of the conference: IV Reunión de la Sociedad Española de Técnicas Neutrónicas
Type of event: Conference **Geographical area:** Non EU International
Type of participation: Participatory - oral communication
Corresponding author: Yes
City of event: Pamplona, Foral Community of Navarre, Spain

Date of event: 22/06/2014
End date: 25/06/2014
Organising entity: Sociedad Española de Técnicas Neutrónicas
Type of contribution: Scientific paper
Alejandro Sanz; Aurora Nogales; Monica Jimenez; Ines Puente-Orench; Tiberio A Ezquerra.

12 **Title of the work:** Phase transitions in supercooled alcohols studied by Simultaneous Dielectric Spectroscopy and Neutron Diffraction
Name of the conference: 7th International Discussion Meeting on Relaxation in Complex Systems
Type of event: Conference **Geographical area:** Non EU International
Type of participation: Participatory - invited/keynote talk
City of event: Barcelona, Catalonia, Spain
Date of event: 21/07/2013
End date: 26/07/2013
Organising entity: Universitat Politècnica de Catalunya **Type of entity:** University
Type of contribution: Scientific paper
Alejandro Sanz; Aurora Nogales; Monica Jimenez; Ines Puente-Orench; Tiberio A Ezquerra.

13 **Title of the work:** Confined dynamics in semicrystalline poly(ethylene terephthalate) studied by incoherent quasielastic neutron scattering
Name of the conference: VI Reunión de la Sociedad Española de Técnicas Neutrónicas
Type of event: Conference **Geographical area:** National
Type of participation: 'Participatory - poster
City of event: Segovia, Castile and León, Spain
Date of event: 24/06/2012
End date: 24/07/2012
Organising entity: Sociedad Española de Técnicas Neutrónicas
Alejandro Sanz; Aurora Nogales; Inés Puente Orench; Javier Campo; Mari Cruz García Gutiérrez; Tiberio A. Ezquerra.

14 **Title of the work:** Confined dynamics in a model block copolymer studied by dielectric and scattering techniques
Name of the conference: 7th International Conference on nanostructured polymers and nanocomposites
Type of event: Conference **Geographical area:** European Union
Type of participation: Participatory - oral communication
City of event: Prague, Czech Republic
Date of event: 24/04/2012
End date: 27/04/2012
Organising entity: European Centre for Nanostructured Polymers **Type of entity:** Associations and Groups
City organizing entity: Terni, Italy
Alejandro Sanz; Aurora Nogales; Daniel R. Rueda; Tiberio A. Ezquerra.

15 **Title of the work:** Adsorption of toluene by ZSM11 zeolite: structural effects
Name of the conference: IV WORKSHOP MODELICO-CM
Type of event: Workshop **Geographical area:** National
Type of participation: Participatory - oral communication
City of event: Madrid, Community of Madrid, Spain
Date of event: 2012
Organising entity: Modélico Network

Alejandro Sanz; Tiberio A. Ezquerra; Enrique Lomba.

16 **Title of the work:** Confined dynamics in semicrystalline polymers: A Dielectric Spectroscopy and Neutron Spin Echo Study
Name of the conference: 6th International Conference on Broadband Dielectric Spectroscopy and its Applications
Type of event: Conference **Geographical area:** Non EU International
Type of participation: Participatory - oral communication
City of event: Madrid, Community of Madrid, Spain
Date of event: 07/09/2010
End date: 10/09/2010
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz; Wolfgang Häußler; Nadia Lotti; Michela Soccio; Tiberio A. Ezquerra; Aurora Nogales.

17 **Title of the work:** Phase behaviour and dynamics in a symmetric Polystyrene-block-Poly(ethyl methacrylate) Coppolymer
Name of the conference: 6th International Conference on Broadband Dielectric Spectroscopy and its Applications
Type of event: Conference **Geographical area:** Non EU International
Type of participation: 'Participatory - poster
City of event: Madrid, Community of Madrid, Spain
Date of event: 07/09/2010
End date: 10/09/2010
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz; Tiberio A. Ezquerra; Aurora Nogales.

18 **Title of the work:** Phase transitions in supercooled ethanol studied by simultaneous dielectric spectroscopy and neutron diffraction measurements
Name of the conference: 6th International Conference on Broadband Dielectric Spectroscopy and its Applications
Type of event: Conference **Geographical area:** Non EU International
Type of participation: 'Participatory - poster
City of event: Madrid, Community of Madrid, Spain
Date of event: 07/09/2010
End date: 10/09/2010
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz; Inés Puente Orench; Mónica Jiménez Ruiz; Aurora Nogales; Tiberio A. Ezquerra.

19 **Title of the work:** Phase transitions in supercooled ethanol studied by simultaneous dielectric spectroscopy and neutron diffraction measurements
Name of the conference: V Reunión de la Sociedad Española de Técnicas Neutrónicas
Type of event: Conference **Geographical area:** National
Type of participation: Participatory - invited/keynote talk
City of event: Gijón, Principality of Asturias, Spain
Date of event: 28/06/2010
End date: 30/06/2010

Organising entity: Sociedad Española de Técnicas Neutrónicas **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz; Inés Puente Orench; Mónica Jiménez Ruiz; Aurora Nogales; Tiberio A. Ezquerra.

20 **Title of the work:** Structure and dynamics of supercooled ethanol during partial and total ordering transition studied by simultaneous dielectric spectroscopy and neutron diffraction
Name of the conference: II WORKSHOP MODELICO-CM
Type of event: Workshop **Geographical area:** National
Type of participation: Participatory - oral communication
City of event: Madrid, Community of Madrid, Spain
Date of event: 2010
Organising entity: Modelico Network **Type of entity:** Associations and Groups
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz; Aurora Nogales; Tiberio A. Ezquerra.

21 **Title of the work:** Dynamics of Nanocomposites based on Polystyrene and Fullerenes Studied by Dielectric and Scattering techniques
Name of the conference: 6th International Discussion Meeting on Relaxations in Complex Systems
Type of event: Conference **Geographical area:** Non EU International
Type of participation: 'Participatory - poster
City of event: Rome, Italy
Date of event: 30/08/2009
End date: 04/09/2009
Organising entity: Sapienza-Università di Roma
City organizing entity: Rome, Italy
Alejandro Sanz; Jack Douglas; Joao Cabral.

22 **Title of the work:** Dynamics of Nanocomposites based on Polystyrene and Fullerenes
Name of the conference: Molecular Spectroscopy Users Meeting 08 (ISIS Neutron Source)
Type of event: Workshop **Geographical area:** National
Type of participation: Participatory - oral communication
City of event: Abingdon, United Kingdom
Date of event: 04/11/2008
End date: 05/11/2008
Organising entity: ISIS Neutron Source
City organizing entity: Didcot, United Kingdom
Alejandro Sanz; Joao Cabral.

23 **Title of the work:** Structure and dynamics of model polymer nanocomposites
Name of the conference: IV Reunión de la Sociedad Española de Técnicas Neutrónicas
Type of event: Conference **Geographical area:** National
Type of participation: Participatory - oral communication
City of event: Sant Feliu de Guíxols, Catalonia, Spain
Date of event: 08/09/2008
End date: 10/09/2008
Organising entity: Sociedad Española de Técnicas Neutrónicas
Alejandro Sanz; Joao Cabral.

24 **Title of the work:** Structure and dynamics of model polymer nanocomposites
Name of the conference: Gordon Research Conference: Polymer Physics
Type of event: Conference **Geographical area:** Non EU International
Type of participation: 'Participatory - poster
City of event: Rhode Island, United States of America
Date of event: 29/06/2008
End date: 07/07/2008
Organising entity: Gordon Research Conference
City organizing entity: West Kingston, United States of America
Alejandro Sanz.

25 **Title of the work:** Structure and dynamics of model polymer nanocomposites
Name of the conference: II Workshop on Applications of Synchrotron Light to Non-Crystalline Diffraction in Materials
Type of event: Seminar **Geographical area:** European Union
Type of participation: Participatory - oral communication
City of event: Madrid, Community of Madrid, Spain
Date of event: 15/10/2007
End date: 17/10/2007
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz.

26 **Title of the work:** Structure and Dynamics of Polymers under Fullerene Nanoconfinement
Name of the conference: 4th European Conference on Neutron Scattering
Type of event: Conference **Geographical area:** European Union
Type of participation: Participatory - oral communication
City of event: Lund, Sweden
Date of event: 25/06/2007
End date: 29/06/2007
Organising entity: European Neutron Scattering Association
Alejandro Sanz; Jack Douglas; Cabral Joao.

27 **Title of the work:** Plasticisation and anti-plasticisation of Polystyrene by C60
Name of the conference: The 2007 Institute of Physics Polymer Physics Group Biennial Conference
Type of event: Conference **Geographical area:** European Union
Type of participation: 'Participatory - poster
City of event: Durham, United Kingdom
Date of event: 2007
Organising entity: Polymer Physics Group (Institute of Physics) **Type of entity:** Associations and Groups
City organizing entity: London, United Kingdom
Alejandro Sanz; Him C. Wong; Joao Cabral.

28 **Title of the work:** Order and segmental dynamics in semicrytalline polymers: poly(butylene isophthalate)
Name of the conference: II reunión de la Asociación de Usuarios de Sincrotrón de España
Type of event: Conference **Geographical area:** National
Type of participation: 'Participatory - poster
City of event: San Lorenzo de el Escorial, Spain
Date of event: 28/09/2005

End date: 30/09/2005
Organising entity: Asociación de Usuarios de Sincrotrón de España
City organizing entity: Community of Madrid, Spain
Alejandro Sanz.

29 **Title of the work:** Structure-Dynamics relationships during the crystallization of Isopropanol by means of simultaneous neutron diffraction and dielectric spectroscopy measurements
Name of the conference: 5th International Discussion Meeting on Relaxations in Complex Systems
Type of event: Conference **Geographical area:** European Union
Type of participation: Participatory - oral communication
City of event: Lille, France
Date of event: 07/07/2005
End date: 13/07/2005
Organising entity: Université des Sciences et Technologies de Lille (USTL)
City organizing entity: Lille, France
Alejandro Sanz; Aurora Nogales; Tiberio A. Ezquerra.

30 **Title of the work:** Order and segmental dynamics in semicrytalline polymers: poly(butylene isophthalate)
Name of the conference: First Workshop Cost P12 Structuring Polymers"
Type of event: Workshop **Geographical area:** European Union
Type of participation: 'Participatory - poster
City of event: Naples, Italy
Date of event: 27/10/2004
End date: 30/10/2004
Organising entity: COST **Type of entity:** Associations and Groups
Alejandro Sanz; Nadia Lotti; Aurora Nogales; Tiberio A. Ezquerra.

31 **Title of the work:** Molecular dynamics and nano-structural development of poly(butylene terphthalate) by simultaneous SAXS, WAXS and Dielectric Spectroscopy measurements
Name of the conference: VIII Reunión del Grupo Especializado de Polímeros
Type of event: Conference **Geographical area:** National
Type of participation: Participatory - oral communication
City of event: Tarragona, Catalonia, Spain
Date of event: 14/09/2003
End date: 17/09/2003
Organising entity: Grupo Especializado de Polímeros (GEP) de la Real Sociedad Española de Física (RSEF) y la Real Sociedad Española de Química (RSEQ) **Type of entity:** Associations and Groups
City organizing entity: Madrid, Community of Madrid, Spain

32 **Title of the work:** Excimers in dilute solutions of N-vinyl carbazole/styrene copolymers of different molar compositions
Name of the conference: VII Reunión del Grupo Especializado de Polímeros
Type of event: Conference **Geographical area:** National
Type of participation: 'Participatory - poster
City of event: San Lorenzo de El Escorial, Community of Madrid, Spain
Date of event: 16/09/2001
End date: 19/09/2001
Organising entity: Grupo Especializado de Polímeros (GEP) de la Real Sociedad Española de Física (RSEF) y la Real Sociedad Española de Química (RSEQ)
City organizing entity: Madrid, Community of Madrid, Spain

Alejandro Sanz; Francisco Mendicuti.

Works submitted to national or international seminars, workshops and/or courses

1 **Title of the work:** Neutron Sources: Applications in Soft and Polymeric Condensed Matter Physics
Name of the event: X Course on the Introduction to the Studies of the Structure of Matter
Type of event: Course
Reasons for participation: Upon invitation
Date of event: 20/03/2013
End date: 22/03/2013
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency

2 **Title of the work:** Soft Condensed Matter: Structure and Dynamics at different time and length scales
Name of the event: Seminar Series of the Instituto de Estructura de la Materia
Date of event: 12/2010
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz Parras.

3 **Title of the work:** Neutrons and Synchrotron Light for the study of Soft Condensed Matter
Name of the event: 7th Course on the Introduction to the Studies of the Structure of Matter
Date of event: 04/2010
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz Parras.

4 **Title of the work:** Scientific Large Facilities for the study of Soft Condensed Matter
Name of the event: 6th Course on the Introduction to the Studies of the Structure of Matter
Date of event: 04/2009
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz Parras.

5 **Title of the work:** Dinámica y estructura durante la cristalización en sistemas formadores de vidrios: Isopropanol frente a Poli(Butilen isoftalato)
Name of the event: Invited seminar
City of event: Madrid, Spain
Date of event: 29/03/2004
Organising entity: Instituto de Matemáticas y Física Fundamental **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz Parras.

6 **Title of the work:** Fluorescencia en polímeros: excímeros intramoleculares en copolímeros de N-vinil carbazol y estireno
Name of the event: Invited seminar
City of event: Madrid, Spain

Date of event: 21/03/2002
Organising entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City organizing entity: Madrid, Community of Madrid, Spain
Alejandro Sanz Parras.

R&D management and participation in scientific committees

Scientific, technical and/or assessment committees

1 **Committee title:** College 6 “Structure and Dynamics of Liquids and Glasses”. Institute Laue-Langevin
Affiliation entity: Institute Laue-Langevin
City affiliation entity: Grenoble, France
Start-End date: 01/04/2016 - 01/10/2018

2 **Committee title:** Member of Ph.D. committee, Universidad Autónoma de Madrid (Madrid, Spain). Thesis defence by Jaime Javier Hernández Rueda in the field of physics of polymers.
Affiliation entity: Universidad Autónoma de Madrid **Type of entity:** University
City affiliation entity: Madrid, Spain
Start-End date: 09/04/2010 - 09/04/2010

Organization of R&D activities

1 **Title of the activity:** Biannual Meeting of the Soft and Polymeric Matter Group (IEM-CSIC).
Type of activity: Biannual Scientific Workshop **Geographical area:** National
Convening entity: Instituto de Estructura de la Materia **Type of entity:** State agency
City convening entity: Madrid, Community of Madrid, Spain
Start-End date: 2009 - 2014 **Duration:** 5 years

2 **Title of the activity:** 6th International Conference on Broadband dielectric spectroscopy and its applications
Type of activity: Scientific Conference **Geographical area:** Non EU International
City of event: Madrid, Community of Madrid, Spain
Convening entity: Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
City convening entity: Madrid, Community of Madrid, Spain
Type of participation: Organiser
Nº assistants: 200
Start-End date: 07/09/2010 - 10/09/2010 **Duration:** 4 days

Other achievements

Stays in public or private R&D centres

1 **Entity:** Roskilde University
Faculty, institute or centre: Science and Environment
City of entity: Roskilde, Denmark
Start-End date: 01/10/2014 - 30/06/2019 **Duration:** 4 years - 9 months
Goals of the stay: Post-doctoral
Provable tasks: Scientific research and teaching activities

2 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 10/2015 - 10/2015 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

3 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 07/2015 - 07/2015 **Duration:** 4 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

4 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 06/2015 - 06/2015 **Duration:** 8 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

5 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 05/2015 - 05/2015 **Duration:** 2 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

6 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 04/2015 - 04/2015 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

7 **Entity:** Spanish Light Source, Alba
City of entity: Barcelona, Spain
Start-End date: 28/11/2013 - 29/11/2013 **Duration:** 1 day
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray diffraction experiment

8 **Entity:** Deutsches Elektronen-Synchrotron **Type of entity:** R&D Centre
Faculty, institute or centre: PETRA III
City of entity: Hamburg, Germany
Start-End date: 01/08/2013 - 03/08/2013 **Duration:** 2 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

9 **Entity:** European Synchrotron Radiation Facility **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 08/03/2013 - 03/2013 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

10 **Entity:** Deutsches Elektronen-Synchrotron **Type of entity:** R&D Centre
Faculty, institute or centre: PETRA III
City of entity: Hamburg, Germany
Start-End date: 01/10/2011 - 03/10/2011 **Duration:** 2 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

11 **Entity:** ISIS neutron source (Rutherford Appleton Laboratory) **Type of entity:** R&D Centre
City of entity: Didcot, United Kingdom
Start-End date: 04/2011 - 04/2011 **Duration:** 5 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

12 **Entity:** FRMII Neutron Source
City of entity: Garching, Germany
Start-End date: 11/2009 - 11/2009 **Duration:** 6 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

13 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 10/2009 - 10/2009 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

14 **Entity:** LLB neutron source **Type of entity:** R&D Centre
City of entity: Saclay, France
Start-End date: 06/2009 - 06/2009 **Duration:** 5 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

15 **Entity:** European Synchrotron Radiation Facility **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 04/2009 - 04/2009 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

16 **Entity:** ISIS neutron source (Rutherford Appleton Laboratory) **Type of entity:** R&D Centre
City of entity: Didcot, United Kingdom
Start-End date: 11/2008 - 11/2008 **Duration:** 5 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

17 **Entity:** Imperial College London **Type of entity:** University
Faculty, institute or centre: Chemical Engineering
City of entity: London, Inner London, United Kingdom
Start-End date: 01/03/2006 - 15/05/2008 **Duration:** 2 years - 2 months - 15 days
Goals of the stay: Post-doctoral
Provable tasks: Scientific research on polymer nanocomposites

18 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 05/2007 - 05/2007 **Duration:** 4 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

19 **Entity:** ISIS neutron source (Rutherford Appleton Laboratory) **Type of entity:** R&D Centre
City of entity: Didcot, United Kingdom
Start-End date: 09/2006 - 09/2006 **Duration:** 2 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

20 **Entity:** Brookhaven National Laboratory **Type of entity:** R&D Centre
City of entity: Upton, United States of America
Start-End date: 04/2005 - 04/2005 **Duration:** 1 month - 7 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

21 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 03/2005 - 03/2005 **Duration:** 3 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

22 **Entity:** Brookhaven National Laboratory **Type of entity:** R&D Centre
City of entity: United States of America
Start-End date: 01/08/2004 - 31/08/2004 **Duration:** 1 month
Goals of the stay: Doctorate
Provable tasks: Research activities on polymeric materials

23 **Entity:** State University of New York at Stony Brook **Type of entity:** University
Faculty, institute or centre: Chemistry
City of entity: Stony Brook, United States of America
Start-End date: 01/06/2004 - 31/07/2004 **Duration:** 2 months
Goals of the stay: Doctorate
Provable tasks: Research activities on polymeric materials

24 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 03/2004 - 03/2004 **Duration:** 4 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

25 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 07/2003 - 07/2003 **Duration:** 7 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

26 **Entity:** Deutsches Elektronen-Synchrotron **Type of entity:** R&D Centre
City of entity: Hamburg, Germany
Start-End date: 11/2002 - 11/2002 **Duration:** 4 days
Goals of the stay: Experiment at large scale facility
Provable tasks: X-ray scattering experiment

27 **Entity:** Institut Laue Langevin **Type of entity:** R&D Centre
City of entity: Grenoble, France
Start-End date: 03/2002 - 03/2002 **Duration:** 4 days
Goals of the stay: Experiment at large scale facility
Provable tasks: Neutron scattering experiment

Obtained grants and scholarships

1 **Name of the grant:** Postdoctoral Tenure JAE-DOC
Aims: Post-doctoral
Awarding entity: Consejo Superior de Investigaciones Científicas **Type of entity:** State agency
Conferral date: 16/05/2008 **Duration:** 3 years
End date: 15/05/2011
Entity where activity was carried out: Instituto de Estructura de la Materia

2 **Name of the grant:** Postdoctoral fellowship
City awarding entity: London, United Kingdom
Aims: Post-doctoral
Awarding entity: Ministerio de Educación y Ciencia (Secretaría de estado de universidades e investigación). Spain
Conferral date: 01/11/2006 **Duration:** 1 year - 7 months - 15 days
End date: 15/05/2008
Entity where activity was carried out: Imperial College London
Faculty, institute or centre: Chemical Engineering

3 **Name of the grant:** Postdoctoral fellowship
City awarding entity: London, United Kingdom
Aims: Post-doctoral
Awarding entity: Consejería de Educación y Ciencia de la junta de comunidades de Castilla La Mancha. Spain

Conferral date: 01/03/2006 **Duration:** 8 months
End date: 01/11/2006
Entity where activity was carried out: Imperial College London
Faculty, institute or centre: Chemical Engineering

4 **Name of the grant:** PhD fellowship (Consejo Superior de Investigaciones Científicas)
Aims: Pre-doctoral
Awarding entity: Project grant FPA2001-2139
Conferral date: 01/01/2002 **Duration:** 4 years
End date: 31/12/2005
Entity where activity was carried out: Instituto de Estructura de la Materia

Co-operation networks

1 **Name of the network:** ASOCIACIÓN DE USUARIOS DE SINCROTRÓN DE ESPAÑA, AUSE
Start date: 01/06/2004 **Duration:** 11 years

2 **Name of the network:** Sociedad Española de Técnicas Neutrónicas
Identification of the network: Neutron Scattering Users
Start date: 01/01/2004 **Duration:** 16 years - 6 months