

Call for research proposals 2017

DPI – Polyolefins Technology Area

DPI

DPI (www.polymers.nl) is an international and independent platform for fundamental, industrially relevant and collaborative research in the field of polymeric materials. Our research programmes connect industrial innovation needs with relevant academic competences. In a chain-of-knowledge approach generic research programmes of strategic technological relevance are initiated by DPI and executed mainly by PhD and Postdoc positions at universities and institutes worldwide.

Programme Area Polyolefins

The mission of the Programme Area is to support and coordinate integrated pre-competitive research projects on polyolefins along the whole chain of knowledge, from (homogeneous and heterogeneous) catalyst synthesis and immobilization, through catalytic olefin polymerization, down to polyolefin characterization, processing and end-use evaluation.

Industrial Partners

Borealis, Braskem, ExxonMobil, Reliance, SABIC, SCG Chemicals and Sinopec are currently participating in the DPI 2.0 programme of the TA PO as industrial funding partners.

Programme details

The current and future Polyolefins programme is based on the following themes:

Catalysis

Key issues: Improving/understanding/modelling Ti-based Ziegler-Natta, Cr-based Phillips-type, and molecular transition metal catalysts; New/improved co-catalysts/activators; New/improved scavengers; New/more controlled routes to (inorganic) catalyst supports; Immobilization of molecular catalysts; New/more controlled catalytic routes to tailored polyolefin architectures (e.g., block copolymers via hybrid catalysis); Advanced molecular kinetics and computational modelling studies of catalysts and processes.

Polymer Structure & Properties, Processing and Modelling

Key issues: Identification of first-order principles in polyolefin structure/properties relationships; Fundamental studies on polyolefin nucleation (including microstructure effects); Development of polyolefin based materials with specific controlled properties (e.g., intrinsic micro-porosity); Polyolefin materials testing in small scale; polyolefin material non-conventional processing at small scale- fibres, films and tapes; Applied rheology and process modelling; Computational rheology and multi-scale modelling; Polyolefin-based (nano)composites.

Polymer Reaction Engineering

Key issues: Technology unit operations; CFD applications; Fundamental studies on polymer particle morphology development and on reactor fouling; Relationships between polymer particle morphology and polymerization kinetics in olefin homo- and co-polymerizations; New concepts in reactor design; Fundamental studies on high pressure (ethylene) polymerization.

New Methods & Exploratory Research

Key issues: New/advanced experimental and computational tools for catalyst synthesis and screening, including High Throughput Experimentation and High Throughput Computation methodologies; New/advanced experimental and computational tools for polymer physical and mechanical characterizations; Development, application and/or understanding of advanced analytical characterization methods; New concepts in olefin co-polymerizations (e.g. functional polyolefins, etc.).

Focus Areas of present Call for Proposals

The industrial funding partners in the PO Programme Committee for the new DPI 2.0 programme are looking forward to project proposals related to the key issues mentioned above.

Preferred topics of new project proposals in this DPI 2.0 Polyolefins Call for Proposals are:

- **(Novel) polyolefins for circular economy: catalysts, processes and/or materials**
- **Novel/exploratory approaches to the polyolefin microstructure-structure-rheology relationship.**

The final portfolio of granted projects will be determined by the overall quality of the proposals and will reflect the scientific and technological interests of the industrial funding partners.

Duration of Projects

The duration of projects is 3-4 years for a PhD position and 1–3 years for a Post-doc position. For multi-staffed projects the duration may be longer depending on detailed project work-plan.

Evaluation of Proposals

The proposals will be evaluated by the relevant Programme Committee (consisting of representatives of the DPI industrial partners), supported by the Scientific Chairman. Important criteria and their relative weight are: scientific excellence (30%), technological impact (30%), clear and concise research objectives (10%), scientific and technological goals that are both challenging and realistic (10%), adequate resources requested (10%) and industrial relevance (including mid-to long term chances for new economic activities, 10%).

Promising proposals having passed a first evaluation round will be reviewed by independent external experts to assess the maturity of the technology, scientific position of the applicants(s) and the scientific quality in terms of novelty and originality.

To achieve focus and mass, clustering of disciplines from various groups, e.g. in multi-staffed projects, is strongly encouraged and proposals with a chain-of-knowledge approach are preferred. Information on expertise of the group(s) and evidence of relevant collaborations is also requested. Proposals with embryonic breakthrough research will be favoured. Proposals that enable cooperation with other Technology Areas, e.g. Performance Polymers are encouraged.

Available Budget

This Call intends to grant **approximately 6 full-time PhD or PostDoc positions**. Indicative tariffs for the positions are those suggested by the corresponding national science organisations for similar activities.

Project Proposal Format

The proposal should be written according to the DPI format given in Annex 1. It may be limited to a few A4 pages (say 5), but should contain sufficient information to allow peer review. It should at least comprise points 1.1 – 1.16 (see hereafter). A clarification, given separately in a free text format as addendum, may elucidate how the proposal specifically fits the DPI TA criteria or provide further project details.

Time schedule

The proposals should be received **ultimately 15 October 2017**. Preliminary evaluation results (First Pass) will be communicated to the applicants mid-December. It is anticipated that final granting will take place end of December 2017 and granted projects can start 1st February 2018 onwards.

DPI Rules and IPR

The research within DPI is subject to Financial and Intellectual Property Right (IPR) Rules laid down in existing documents. As regards IP Rules, in essence, we follow EU rules, in which the Source Knowledge Institute is the owner of the IPR, whilst the funding partners have first right of negotiation and/or refusal. Those parties interested to apply, but unfamiliar with these rules, are advised to contact

the DPI office (dpi@polymers.nl) for receiving a copy of the Articles and Regulations before writing and submitting a research proposal. To receive a DPI grant the executing Knowledge Institute must accept the DPI Terms and Conditions by signing the DPI Participation Letter for academic participants. At all stages of the selection and granting process, the proposals will be treated with Confidentiality.

Submission of research proposals

Proposals should be submitted in electronic form (in WORD or PDF format) to dpi@polymers.nl, with subject reference to the respective Programme Area. You will receive an acknowledgement of the receipt of your proposal from DPI within five working days.

Further enquiries (including on industrial experts that can be contacted) can be made via e-mail to the Programme Area Scientific Chair, Prof. Vincenzo Busico (v.busico@polymers.nl)/or the Programme Area Coordinator, Dr. J.E.Stamhuis (j.e.stamhuis@polymers.nl).

Annex 1: DPI proposal format

Descriptive part:

- 1.1 Title
- 1.2 Acronym
- 1.3 Technology Area: DPI 2.0 Polyolefins
- 1.4 Research schools in which the research group participates (PTN, NIOK, or other if applicable)
- 1.5 Institute: University/group, Research Institute/department
- 1.6 Applicant(s): professor(s)¹, names, affiliation, address details including e-mail and tel. nrs.
- 1.7 Project leader(s): senior research staff members involved in the project.

Scientific part:

- 1.8 Abstract (Max. 100 words)
- 1.9 Research objectives (clear and concise)
- 1.10 Description of the current (international) state of the art. Please add crucial literature references including patents as addendum where applicable.
- 1.11 Scientific and technological approach and potential impact.
- 1.12 Targets and deliverables per annum (typically half A4 page per fte/ per project)
- 1.13 Co-operation along the chain of knowledge with academia and/or industrial partners relevant for the execution of the project;
- 1.14 Potential follow-up projects/partners for valorization; in-kind contributions.
- 1.15 Suggestions for independent external reviewers of the proposal.

Budget:

- 1.16 Requested budget:
 - Research Staff: number and role of researchers, duration (1 to 4 years), tariff (per annum and/or total staff cost compensation)
 - Equipment: necessary equipment > 10 k€, with specific motivation (equipment < 10 k€ is included in the tariffs of the researchers). Please note that only in exceptional cases DPI will fund the purchase of new (major) equipment.
 - Purchased analysis time for very special analytical techniques (>10 k€) with motivation.

General:

- 1.17 Public Summary

¹ As applicant only full-time professors at a DPI Partner university or department directors of Partner Institutes are accepted; part-time professors, lecturers and senior researchers (including those from industry) can apply under the auspices of a full-time professor at a DPI Partner university