

# EINDHOVEN POLYMER LABORATORIES

## Re-accreditation report

Accreditation PTN: 1996 – 2002  
Accreditation EPL: June 10, 2003 - 2009  
Acronyme: EPL

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Cooperation: PTN, Polymer Technology in the Netherlands

Date: November 10, 2009

**EINDHOVEN POLYMER LABORATORIES  
RE-ACCREDITATION REPORT 2009**

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## 1. MISSION

Polymers are, compared to alternative materials with which we shape the world, mainly characterized by their low density, ease of processing and shaping, possibilities of functional integration and an almost unlimited flexibility in molecular design. Moreover they are in most cases relatively cheap. These characteristics determine not only the societal needs for improved polymer systems in a multitude of application areas like protection, isolation, transportation, communication, illumination, packaging, housing, furniture, clothing etc. but also set the controlling scientific questions to be answered within this research area.

By (i) critically investigating recent trends in modern polymer science and technology, (ii) by comparing activities and choices made here with those of famous groups worldwide that form the source of inspiration, and (iii) by trying to define challenges for the future that act to inspire young people and students, meanwhile (iv) building further on the strength and unique capabilities of the present scientific staff, EPL, Eindhoven Polymer Laboratories, defined three research areas where the focus of polymer science and technology at the TU/e will be:

1. Complex Molecular Systems
2. Functional Polymers and Devices
3. Multi-scale Modeling and Advanced Characterization

The first focus area tries to answer questions on how complex molecular systems form by self-organizing and function, partially mimicking nature and life, the second area investigates on how useful advanced devices can be made out of complex, usually functional, polymers, while the third focus area identifies and addresses the questions concerning our understanding of polymers and polymer systems, and giving directions on how intense trial and error can be circumvented.

The DPI, Dutch Polymer Institute, defined a possible fourth focus area, Materials Design and Engineering, which reflects the industrial need to also design and engineer new polymer materials, partly based on bio-based renewable resources. Of course the boundaries between the focus areas are open and transparent and lots of mutual cross-interactions exist. Strong and intense cooperation with other disciplines is guaranteed by cross-appointments of a number of critical individuals.

This summary of the scientific goals of the polymer research done in the research school EPL is phrased in the *chain-of-knowledge* idea that we practised within EPL during the last 15 years. This phrase tries to express that successful research and innovations in polymer science and engineering can only be realized if the total line, starting with monomer synthesis and ending in processing and design, is successfully elaborated.

## 2. EXECUTIVE SUMMARY: THE BASE FIGURES OF EPL 2002 - 2008

- |  |  |
|--|--|
| 1. Total of 189 EPL dissertations in 6 years is              | <b>30</b> dissertations per year       |
| 2. Total of 1949 EPL publications per 6 years is             | <b>300</b> publications per year       |
| 3. Total of 62,2 M€ external funding in period 2002 -2008 is | <b>10</b> M€ per year                  |
| 4. In this period EPL had almost 100 tenured staff           | <b>98</b> (total staff)                |
| from which 50% non-supporting staff                          | <b>45</b> (scientific staff)           |
| and furthermore 200 non- tenured staff:                      | <b>45</b> (senior: PD's)               |
|  | <b>150</b> (junior: PhD's)             |
| 5. Origin EPL funding in period 2002-2008                    | 30% EZ                                 |
|  | 30% NWO                                |
|  | 15% Industry                           |
|  | 10% European Committee                 |
|  | 15% University (matching)              |
| 6. Total # PhD students educated by PTN/EPL, RPK '02 – '08   | <b>683</b> (for details see Section 3) |
| <b>A:</b> Polymer Chemistry                                  | 225                                    |
| <b>B:</b> Polymer Physics                                    | 184                                    |
| <b>C:</b> Polymer Properties                                 | 123                                    |
| <b>D:</b> Polymer Rheology                                   | 48 (+55 in 2009)                       |
| <b>E:</b> Polymer Processing                                 | 46 (+55 in 2009)                       |
| <b>II:</b> Polymer Innovations                               | 57                                     |
| 7. Total # industrials educated by PTN/EPL, RPK '02 – '08    | <b>74</b>                              |

## 3. EDUCATION IN EPL in period 2002 - 2008

Post-graduate courses are successfully organized by the national research school PTN that is fully supported by EPL. Every course is given once in every two years on the Fridays in Utrecht. A course typically takes 10 successive full Fridays. See for all information: <http://home.ptn.nu/rpk>.

year	module	# Ph.D students	# industrial participants	income k€	expenses k€	result k€
2002	RPK-A	44	4	27,8	32,8	-5,0
	RPK-D	24	2	14,9	34,0	19,1
2003	RPK-E	21	3	15,9	26,8	-10,9
	RPK-B	88	5	58,0	38,0	20,0
2004	RPK- $\pi$	10	3	11,0	23,7	-12,7
	RPK-C	80	5	53,8	52,7	1,1
	RPK-A	70	5	47,2	48,0	-0,8
2005	RPK- $\pi$	22	1	16,7	20,2	-3,5
	RPK-D	24	1	15,9	35,2	-19,3
	RPK-B	54	4	38,6	34,9	3,7
2006	RPK-E	25	6	22,8	41,1	-18,3
	RPK- $\pi$	12	9	21,4	18,2	3,2
	RPK-A	62	6	49,8	41,2	8,6
2007	RPK-C	43	7	38,7	26,9	11,8
	RPK-B	42	5	36,4	32,8	3,6

<b>2008</b>	<b>RPK-PI</b>	13	5	17,3	21,2	-3,9
	<b>RPK-A</b>	49	3	37,3	45,3	-8,0
<b>2009</b>	<b>RPK-DE</b>	(55)				
<b>Total</b>		<b>683</b>	<b>74</b>	<b>523,5</b>	<b>573,0</b>	<b>-49,5</b>

A total number of 82 (status 31-12-2008) students successfully finished RPK (4 out of 5 modules with exams completed) and were registered as RPK; 53 of them originated from EPL.

#### 4. BACHELORS AND MASTERS

The groups participating in EPL contribute on a normal regular basis to the bachelor and master programs of the 4 different departments involved: Mechanical Engineering, Chemistry and Chemical Engineering, Applied Physics, Biomedical Engineering.

#### 5. ORGANIZATION

##### BOARD EPL

Prof.dr.ir. H.E.H. Meijer	(sci. dir., W)
Prof.dr.ir. R.A.J. Janssen	(N, ST)
Prof.dr. C.E. Koning	(ST)
G.N.M.J. Verschuren	(liaison officer)

##### RESEARCH COMMITTEE EPL

Prof.dr. E.W. Meijer	(chairman, ST, BMT)
Prof.dr.ir. H.E.H. Meijer	(W)
Prof.dr.ir. R.A.J. Janssen	(N, ST)
Prof.dr.ir. F.P.T. Baaijens	(BMT)

##### EDUCATIONAL COMMITTEE EPL

Dr.ir. P.P.A.M. van der Schoot	(chairman, N)
Prof.dr. A.M. van Herk	(MsC director ST)
Prof.dr. R.P. Sijbesma	(ST)
Dr.ir. M.H.P. van Genderen	(MsC director BMT)
Dr.ir. G.W.M. Peters	(W)

##### BOARD of the former research school PTN

Dr. D. Medema Dick†, ex-Research Director Shell	(chairman)
Prof.dr. P.J. Lemstra, TU/e	(present chairman)
Dr. L.N.I.H. Nelissen, TU/e	(secretaris)

##### Members of the BOARD PTN representing universities:

Dr. A. Boersma	TNO
Prof.dr. G ten Brinke	RUG
Prof.dr. M Cohen Stuart	WUR
Prof.dr. J. Feijen	UT
Prof.dr. G. Flier	WUR
Prof.dr. J. Fraaije	RUL
Prof.dr. M.A.J. Michels	TU/e
Prof.dr. S.J. Picken	TUD
Prof.dr. G.J. Vancso	UT

##### Members of the BOARD PTN representing other organizations:

Prof.dr.ir. H.E.H. Meijer, TU/e on behalf of	EPL
Prof.dr. E.W. Meijer, TU/e on behalf of	KNCV

#### ADVISORY BOARD PTN and EPL

Prof. Dr. D.J. Broer (Dick)  
Dr. M. Hendriks (Marc) (ex RvA)  
Dr. E. Hilbrink  
Prof. Dr. J.W. (Hans) Hofstraat (ex RvA)  
Prof. dr. J. (Jos) Put  
Drs. W.F. de Ruijter  
Dr. ir. E.J. Sol

Research Director, Philips Research  
DSM EBA Biomedical Materials  
Manager R&D, A.E.P. Industries  
Research Director, Philips Research  
Research Director, DSM Research  
NRK Nederland  
Director TNO Industry

## 6. COOPERATION

The groups participating in EPL cooperate on a normal and regular basis with colleagues in the Netherlands and abroad. A special cooperation exists with (i) the DPI, Dutch Polymer Institute, organization that also has its centre in Eindhoven at the campus of the TU/e and that provides major funding of the EPL research, and (ii) with PTN, the former national research school on polymers, with which we share the supervisory board and with which we organize the teaching for PhD students and Postdocs in the RPK courses held in Utrecht, see Section 3.

## 7. PARTICIPATING FULL CHAIRS

Chemical Eng. and Chemistry:	Prof.dr. E.W. Meijer, Prof.dr.ir. R.A.J. Janssen, Prof.dr. R.P. Sijbesma Prof.dr. U.S. Schubert, Prof.dr. C.E. Koning, Prof.dr. A.M. van Herk, Prof.dr. P.J. Lemstra,	<a href="http://yp.chem.tue.nl/showemp.php/176">http://yp.chem.tue.nl/showemp.php/176</a> <a href="http://yp.chem.tue.nl/showemp.php/189">http://yp.chem.tue.nl/showemp.php/189</a> <a href="http://yp.chem.tue.nl/showemp.php/174">http://yp.chem.tue.nl/showemp.php/174</a> <a href="http://yp.chem.tue.nl/showemp.php/179">http://yp.chem.tue.nl/showemp.php/179</a> <a href="http://yp.chem.tue.nl/showemp.php/218">http://yp.chem.tue.nl/showemp.php/218</a> <a href="http://yp.chem.tue.nl/showemp.php/372">http://yp.chem.tue.nl/showemp.php/372</a> <a href="http://yp.chem.tue.nl/showemp.php/291">http://yp.chem.tue.nl/showemp.php/291</a>
Applied Physics:	Prof.dr. M.A.J. Michels,	<a href="http://yp.phys.tue.nl/showemp.php/190">http://yp.phys.tue.nl/showemp.php/190</a>
Mechanical Eng.:	Prof.dr.ir. H.E.H. Meijer,	<a href="http://yp.wtb.tue.nl/showemp.php/4">http://yp.wtb.tue.nl/showemp.php/4</a>
Biomedical Eng.:	Prof.dr.ir. F.P.T. Baaijens,	<a href="http://yp.bmt.tue.nl/showemp.php/11">http://yp.bmt.tue.nl/showemp.php/11</a>

#### Total research staff

	2002	2003	2004	2005	2006	2007	2008
1: Macro-organic & Bio ST&BMT	21.05	22.90	25.30	26.35	22.60	23.85	24.40
2: Molecular Mat. & Nano ST&N	11.80	14.10	16.20	20.40	23.26	21.86	21.65
3: Supramolecular Polymer Chem. ST	2.45	4.75	6.35	4.85	5.05	5.30	5.65
4: Macromol. Chem & Nano ST	8.20	14.30	16.30	18.40	19.50	22.47	19.43
5: Polymer Chemistry ST	20.30	21.10	21.00	19.50	19.40	20.60	25.50
6: Polymer Technology Group ST	22.60	20.85	23.90	25.55	22.21	15.26	12.84
7: Polymer Physics N	8.45	10.54	10.12	7.15	9.21	9.93	9.30
8: Polymer Technology W	17.80	17.30	13.30	14.20	12.90	12.20	14.50
9. Soft Tissue Biomech. BMT	12.70	13.20	16.50	19.50	20.40	19.80	19.90
<b>Total in fte</b>	<b>125.4</b>	<b>139.0</b>	<b>148.9</b>	<b>155.9</b>	<b>154.5</b>	<b>151.3</b>	<b>153.2</b>

## 8. NATIONAL POSITION OF EPL

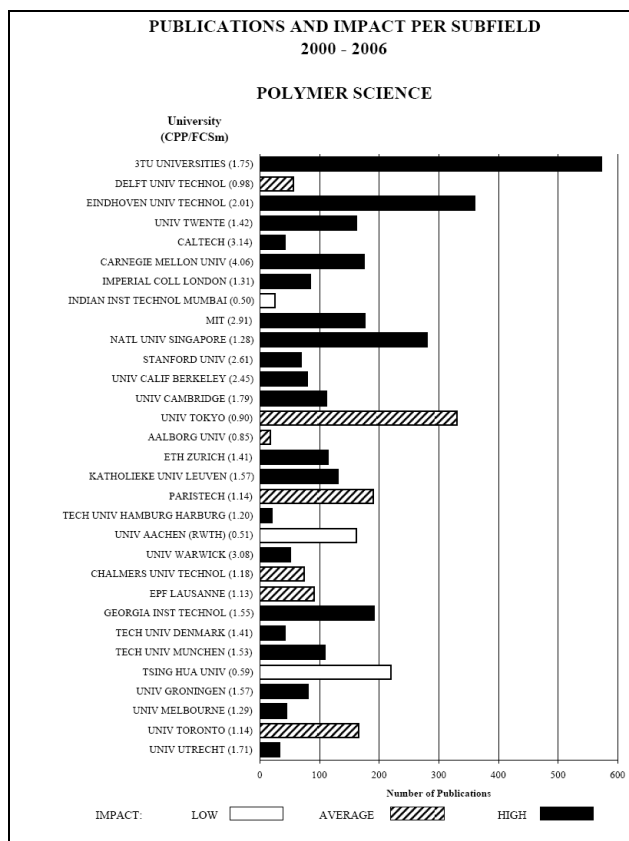
**History leading to EPL.** In the last two decades, the activities in the area of polymer science and engineering have increased almost exponentially on the campus of the TU/e. The various polymer groups in the departments of Chemical Engineering and Chemistry (profs. E.W. Meijer, A.L. German and P.J. Lemstra) and Mechanical Engineering (profs. H.E.H. Meijer and F.P.T. Baaijens) expanded in size due to ample funding from existing and novel funding schemes, e.g. NWO, STW, EC, and notably the Dutch Polymer Institute, DPI, since 1997. As a result polymers were regarded as one of the most profound priority areas of the TU/e. Prof. M.A.J. Michels was appointed to a new chair on Theoretical and Polymer Physics at the department of Applied Physics (1998). Two new chairs, profs. R.A.J. Janssen and U.S. Schubert, both appointed in 2000, were established in Chemical Engineering and Chemistry. In the same year, prof. C.E. Koning became the successor of prof. A.L. German, while dr. A. van Herk was promoted to professor in 2001. In 2002 it was decided to formalize the existing cooperation within EPL and June 10, 2003, EPL received the official KNAW recognition.

**History from the start of EPL.** The (gradual) start of the new department Biomedical Engineering, BMT, made prof. F.P.T. Baaijens not only for 100% move to this department, now working in the area of soft tissue biomechanics and tissue engineering, but also to accept the position of dean of BMT. To strengthen his group, in part-time dr. S.P. Hoerstrup from the university hospital in Zurich was appointed as visiting professor on November 1, 2003. Prof. E.W. Meijer (Bert) decided to participate with his group for 50% in BMT and, moreover, has been asked to succeed prof. E.M. Meijer (Emmo) as chair of the area Chemical Sciences within NWO. Prof. R.A.J. Janssen chose to participate with 50% of his group in the Applied Physics department of the TU/e. Prof. P.J. Lemstra decided to step back from the position of scientific director of DPI and he was succeeded by prof. M.A.J. Michels as from April 2004, who on his turn was succeeded by prof. J.G.H. Joosten (DSM). In the group of prof. H.E.H. Meijer (Han), two new part-time profs were appointed, prof. P. Smith from the ETH Zurich on April 1, 2003 and prof. J.M.J. den Toonder from Philips on Februari 15, 2004. Meanwhile the research area Polymers was in 2004 chosen as one of the ten priority areas of the TU/e. The TU/e wide academic assessment emphasized the international recognition of the high quality of the polymer research carried out at TU/e. The industrial assessment was even more pronounced: *“At the TU/e polymers are top quality, still fast growing and without any doubt priority number one for this university”*.

**Last years developments in EPL.** In 2005 the procedure was started to the promotion of dr. R. Sijbesma to full professor, which has been effected finally in May 2006. The research assessment of the Applied Physics department was finalized, showing the expected good to excellent results for the two polymer groups involved (profs. M.A.J. Michels and R.A.J. Janssen). Just recently, the group of Prof. H.E.H. Meijer in Mechanical Engineering scored for the third time in a row, maximum in the research assessment over the period 2000-2007. In 2007, Prof. U.S. Schubert decided to accept a position as full professor in Jena, Germany. In 2008 Prof. F.P.T. Baaijens was appointed as the scientific director of BMM, the BioMedical Materials program and the TU/e started in the same year with the independent Institute of Complex Molecular Systems, ICMS, with Prof. E.W. Meijer as scientific director. Especially the ICMS will strongly support and strengthen the research activities in polymers at the TU/e by appointing new talented researchers in different areas. Finally, in 2009 the results of the research assessment of the Chemistry Departments became available, with excellent results for all polymer groups, see Section 9.

## 9. INTERNATIONAL POSITION OF EPL

In 2007, the three TU's in the Netherlands bench-marked their activities in the different research fields with competing groups in selected famous universities all over the world. On page 297 we find the results of this Leiden study of the area of Polymer Science. It is easily concluded from this report that the EPL score is not only quantitatively the most important in the world (length of the bars in the figure), but also qualitatively, as measured via citation analyses (darkness of the bars in the figure).



This study is supported by our own data concerning the number of publications and the impact of the work as measured via citations and h-indices, see Appendix 3 (Publication Records).

In 2006, the department of Applied Physics was assessed by an international VSNU committee, in 2008 the department of Mechanical Engineering, and in 2009 the department of Chemistry and Chemical Engineering. With that, almost all groups within EPL (with an exception of the Soft Tissue Biomechanics group of Frank Baaijens, who will be assessed in 2010 for the first time) were internationally evaluated and their score is rather impressive:

	Quality	Productivity	Relevance	Viability
<b>Research programmes</b>				
1: Macro-organic & Bio ST&BMT	5	5	5	5
2: Molecular Mat. & Nano ST&N	5	5	5	5
3: Supramolecular Polymer Chem. ST	5	5	5	4
4: Macromol. Chem & Nano ST	not assessed since Schubert left the TU/e			
5: Polymer Chemistry ST	4	5	4	4
6: Polymer Technology Group ST	4	5	5	NA
7: Polymer Physics N	5	4.5	4.5	4.5
8: Polymer Technology W	5	5	5	5
9. Soft Tissue Biomech. BMT	not assessed yet, will follow in 2010			

Research programme number 4 did not receive an assessment, since Schubert left the TU/e to accept a position in Germany. The viability of research programme number 6 was “not applicable”, since Lemstra will retire soon and decided to discontinue his group, but not the work. Therefore his staff and students were transferred to neighbouring polymer groups within the department. For details and text of the QANU Research Committees, see Appendix 2 (Quality Assessments Research of the EPL groups).



## 10. EPL FINANCES

### Total external funding in k€ 2000-2012

Details funding in k€										
	2000-2004	2005	2006	2007	2008	2009	2010	2011	2012	total
1: Macro-org.+ Bio ST&BMT	7008	2116	2141	2307.5	2007.5	1738	665	498	203	<b>18684</b>
2: Mol. Mat. & Nano ST&N	6768	1492	1819	1938	1802	1663	1147	489	362	<b>17480</b>
3: Supramol. Pol. Chem. ST	558	404	388.5	687.5	649.5	231	90	46		<b>3055</b>
4: Macromol Chem Nano ST	6195	2974	2749	2121	1612	846	137			<b>16634</b>
5: Polymer Chemistry ST	4111	1017	1077	1328	1813	1598	1259	839	304	<b>13346</b>
6: Polymer Technology ST	7714	1516	1501	1026	902	954	767	707	549	<b>15636</b>
7: Polymer Physics N	2616	589	724	800	714	717	644	508	297	<b>7609</b>
8: Polymer Technology W	4597	691	661	1028	980	1366	1071	570	350	<b>11314</b>
9. Soft Tissue Biom. BMT	1817	1408	1476	1156	1521	1143	1030	1030	735	<b>11316</b>
<b>Total k€ external funding</b>	<b>41384</b>	<b>12207</b>	<b>12536</b>	<b>12392</b>	<b>12001</b>	<b>10256</b>	<b>6810</b>	<b>4687</b>	<b>2800</b>	<b>115074</b>

## 11. GUARANTEES

The research area Polymers was in 2004 chosen as one of the ten priority areas of the TU/e.

In 2008 the university started to finance the Institute of Complex Molecular Systems, ICMS, with Prof. E.W. Meijer as scientific director, for the next coming 6 years. The ICMS will strongly support and strengthen the research activities in polymers at the TU/e by appointing new talented researchers in different areas.

The table below sketches the situation of EPL in 2008. Some changes have taken place since (Schubert left the TU/e to continue his career in Germany), or will take place. As an example of the last: Lemstra will not be succeeded, given the financial consequences of a systematic low inflow in the department of Chemistry and Chemical Technology. But the research of his group will continue, partly in Cor Koning's group, partly in Dick Broer's group, who will soon retire from Philips and work full time at the TU/e. In contrast, successors for both Michels and Meijer (HEH) are already looked for, and plans for implementation are made. Of course, external funding (which concerns almost all non-tenured staff) depends on the activity and success in proposal writing of the tenured staff. Nevertheless it is anticipated that overall at least 70% of the polymer activity in EPL is guaranteed in the next period.

### Composition of EPL research staff in 2008

	tenured	post-docs	Ph.D	total
1: Macro-organic & Bio ST&BMT	2.75	9.60	12.05	<b>24.40</b>
2: Molecular Mat. & Nano ST&N	2.50	3.15	16.00	<b>21.65</b>
3: Supramolecular Polymer Chemistry ST	0.50	3.40	1.75	<b>5.65</b>
4: Macromol. Chem & Nano ST	0.18	8.25	11.00	<b>19.43</b>
5: Polymer Chemistry ST	2.30	3.40	19.80	<b>25.50</b>
6: Polymer Technology Group ST	2.42	2.28	8.14	<b>12.84</b>
7: Polymer Physics N	2.50	1.35	5.45	<b>9.30</b>
8: Polymer Technology W	2.50	1.70	10.30	<b>14.50</b>
9. Soft Tissue Biomech. BMT	2.00	2.60	12.30	<b>16.90</b>
<b>Total</b>	<b>17.65</b>	<b>35.73</b>	<b>96.79</b>	<b>150.17</b>

## 12. PhD EFFICIENCY

### Dissertations

	2002	2003	2004	2005	2006	2007	2008	total
1: Macro-organic & Bio ST&BMT	2	1	4	5	8	5	2	27
2: Molecular Mat. and Nano ST&N	1	2	3	4	2	3	6	21
3: Supramolecular Polymer Chemistry ST	-	-	-	-	2	1	1	4
4: Macromol. Chem. & Nano ST	-	-	3	2	2	2	2	11
5: Polymer Chemistry ST	4	2	6	9	4	4	5	34
6: Polymer Technology Group ST	6	4	6	11	3	5	5	40
7: Polymer Physics N	-	3	1	-	-	1	3	8
8: Polymer Technology W	4	5	2	3	3	1	5	23
9. Soft Tissue Biomech. BMT	2	3	1	5	2	4	4	21
<b>Total</b>	<b>19</b>	<b>20</b>	<b>26</b>	<b>39</b>	<b>26</b>	<b>26</b>	<b>33</b>	<b>189</b>

This table illustrates the relatively large and substantial number of EPL PhD students that successfully finished their thesis in the period 2002 – 2008. As is evident from Appendix 5 (Details about all the 9 EPL groups, their Postdocs and PhD's: Gender, Study Efficiency and Jobs) also the efficiency of their studies is excellent. Only very few students discontinued their work. Most of those discontinuations occurred in the group of prof. Ulrich Schubert (Macromolecular Chemistry and Nano-Science). They are caused by the too low advising capacity, combined with a too large number of PhD students, in this group. The problem was, interestingly, caused by a too successful DPI funding. And the problem was recognized already in an early stage, but further neglected. However, the majority of all EPL PhD students finished successfully and most of them in 4 years time, while few took 5 years to finish.

## 13. CAREER PERSPECTIVES

As is also evident from Appendix 5 (Details about all the 9 EPL groups, their Postdocs and PhD's: Gender, Study Efficiency and Jobs) the career perspectives of all EPL Postdocs and PhD students is excellent.

From the 174 Postdocs that finished their temporary stay at EPL in the period 2002-2008, 39 were female (22%), while a relatively large number of 35 (20%) obtained an academic career as assistant, associate or even full professor:

<b>Finsihed Postdocs</b>	<b>total in period</b>	<b>female</b>	<b>academic career</b>
1: Macro-organic & Bio ST&BMT a: ST	28	4	7
b: BMT	13	5	2
2: Molecular Mat. & Nano ST&N a: ST	18	5	2
b: N	4	1	1
3: Supramolecular Polymer Chemistry ST	14	2	1
4: Macromol. Chem & Nano ST	33	4	4
5: Polymer Chemistry ST	13	3	1
6: Polymer Technology Group ST	20	5	7
7: Polymer Physics N	9	2	4
8: Polymer Technology W	12	1	5
9. Soft Tissue Biomech. BMT	10	7	1
<b>Total</b>	<b>174</b>	<b>39</b>	<b>35</b>

From the in total 215 PhD students that finished their PhD in the period 2002-2008, 74 were female, which is 34% and that is a substantial number for a technology area, while 12 (5%) finally obtained an academic position:

<b>Finished PhD students</b>	<b>total in period</b>	<b>female</b>	<b>academic career</b>
1: Macro-organic & Bio ST&BMT a: ST	15	3	2
b: BMT	16	9	1
2: Molecular Mat. & Nano ST&N a: ST	15	4	0
b: N	12	1	0
3: Supramolecular Polymer Chemistry ST	7	3	1
4: Macromol. Chem & Nano ST	23	8	0
5: Polymer Chemistry ST	29	12	2
6: Polymer Technology Group ST	37	13	0
7: Polymer Physics N	8	1	0
8: Polymer Technology W	25	4	2
9. Soft Tissue Biomech. BMT	28	16	4
<b>Total</b>	<b>215</b>	<b>74</b>	<b>12</b>

#### 14. ACTIONS

Recently the discussions about the different polymer related organizations restarted, basically because the DPD's, the Dutch Polymer days, as organized every year in Lunteren, will from 2010 be organized in Veldhoven, now combined with other activities of CW, Chemische Wetenschappen, from NWO. The discussion on who is going to organize this new DPD events, including the selection of the candidates for the annual PTN Dick Medema award, includes the discussion on the future organization of PTN and is relevant not only because of DPD, but also because of RPK. At the moment of writing this report, it is concluded that the young colleagues of the polymer community in the Netherlands will have to take over the different responsibilities. This will be discussed during the coming DPD's in 2010.

#### 15. MALE-FEMALE RATIO

From the Postdocs finishing their employment in the period 2002-2008, 22% was female and from the PhD students 34%, see for all details the two tables above in Section 13 and Appendix 5 (Details about all the 9 EPL groups, their Postdocs and PhD's: Gender, Study Efficiency and Jobs).

## APPENDIX 1: Guarantee

### Garantieverklaringen inzet EPL

The tenured staff of EPL amounts (December 2008) 9 full professors, 16 part-time professors, 15 associate professors and 15 assistant professors. The non-tenured staff amounts circa 45 Postdocs and 150 PhD students.

### Tenured University Staff EPL, December 2008

Research Teams	full professors	visiting professors (0.2)	associate professors	assistant professors
<b>Macro-Organic Chemistry- ST</b>	Prof.dr. E.W. Meijer (0.5)	Prof. W.J. Feast	Dr. J.A.J.M. Vekemans Dr. A.P.H.J. Schenning	Dr.ir. A.R.A. Palmans
<b>Biomedical Chemistry - BMT</b>	Prof.dr. E.W. Meijer (0.5)	Prof.dr. R.J.M. Nolte Prof.dr.ir. H.L. Vader	Dr.ir. M. v. Genderen	Dr. M. Merckx Dr. P.Y.W. Dankers (0.5)
<b>Molecular Materials &amp; Nano-systems - ST</b>	Prof.dr. R.A.J. Janssen (0.5)			Dr. S.C.J. Meskers
<b>Molecular Materials &amp; Nano-systems - TN</b>	Prof.dr. R.A.J. Janssen (0.5)	Prof.dr. R. Coehoorn	Dr.ir. C.F.J. Flipse	Dr.ir. M.M. Wienk Dr.ir. M. Kemerink
<b>Supramolecular Polymer Chemistry - ST</b>	Prof.dr. R.P. Sijbesma			
<b>Polymer Chemistry – ST</b>	Prof.dr. C.E. Koning Prof.dr. A.M. v. Herk	Prof. V. Busico	Dr.ir. L. Klumperman(0.2) Dr.ir. R. Duchateau	Dr. A. Heise Dr. H. Heuts
<b>Polymer Technology - ST</b>	Prof.dr. P.J. Lemstra	Prof.dr. D. Broer Prof.dr. C. Bailly Prof.dr. E.L.F. Nies Prof.dr.ing. T. Peijs Prof. dr S. Rastogi Prof. G.L.M.M. Verbist	Dr. C.W.M. Bastiaansen Dr. J.G.P. Goossens	Dr. D. Hristova
<b>Polymer Physics – N</b>	Prof.dr. M.A.J. Michels		Dr. P.A. Bobbert	Dr. P.P.A.M. vd Schoot Dr. A.V. Lyulin Dr. C. Storm (0.5)
<b>Polymer Technology – W</b>	Prof.dr. H.E.H. Meijer	Prof.dr. J. den Toonder	Dr.ir. P.D. Anderson Dr.ir. L.E. Govaert Dr.ir. M.A. Hulsen Dr.ir. G.W.M. Peters Dr.ir. P.J.G. Schreurs	Dr. H.Wyss (0.5)
<b>Soft Tissue Biomechanics &amp; Tissue Engineering - BMT</b>	Prof.dr. F.P.T. Baaijens	Prof.dr. D. Bader Prof.dr. M. Post Prof.dr. S. Hoerstrup Prof.dr. J. Bartunek	Dr. C.V.C. Bouten Dr.ir. C.W.J. Oomens	Dr.ir. A. Driessen-Mol Dr.ir. D. v.d. Schaft

### **Garantieverklaring**

De faculteiten Scheikundige Technologie, Natuurkunde, Werktuigbouwkunde, en Biomedische Technologie garanderen voor de periode 2009 – 2015 een inzet van minimaal 70% van de vaste staf in het gebied van polymeeronderzoek in de ruime zin van het woord, zoals in bovenstaande tabel geschetst, en de bijbehorende infrastructuur in de laboratoria.

Namens het bestuur van de Faculteit Scheikundige Technologie,  
Prof.dr. P.J. Lemstra datum:  
Decaan

Namens het bestuur van de Faculteit Technische Natuurkunde,  
Prof.dr.ir. K. Kopinga datum:  
Decaan

Namens het bestuur van de Faculteit Werktuigbouwkunde,  
Prof.dr.ir R. de Borst datum:  
Decaan

Namens het bestuur van de Faculteit Biomedische technologie,  
Prof.dr. P.A.J. Hilbers datum:  
Decaan

## APPENDIX 2: Quality assessments

### QANU research review Chemical Engineering 3TU; (TUD, UT, TU/e), October 2009

	Quality	Productivity	Relevance	Viability
<b>Research programmes</b>				
Macro-organic Chemistry E.W. Meijer	5	5	5	5
Molecular Materials and Nanosystems R.A.J. Janssen	5	5	5	5
Supramolecular Polymer Chemistry R.P. Sijbesma	5	5	5	4
Macromolecular Chemistry and Nanoscience U.S. Schubert	NA	NA	NA	NA
Polymer Technology P.J. Lemstra	4	5	5	NA
Polymer Chemistry C.E. Koning	4	5	4	4
Functional Polymer Colloids via Radical Polymerization A.M. van Herk	4	5	4	4

### QANU research review Physics Research, April 2006

	Quality	Productivity	Relevance	Viability
<b>Research programmes</b>				
Polymer Physics M.A.J. Michels	5	4.5	4.5	4.5

### QANU research review Mechanical Engineering 3TU; (TUD, UT, TU/e), December 2008

	Quality	Productivity	Relevance	Viability
<b>Research programmes</b>				
Polymer Technology H.E.H. Meijer	5	5	5	5

For the detailed assessments per programme, see below.

## Macro-organic Chemistry

Programme director:	Prof. dr. E.W. Meijer	
Research staff 2007:	24,25	
Assessments:	Quality:	5
	Productivity:	5
	Relevance:	5
	Viability:	5

### *Short description*

The research is based on three sub-disciplines: 1) biochemistry and chemical biology; 2) macromolecular and organic chemistry; and 3) nanoscience and nanotechnology. With the design, synthesis and characterization of supramolecular multi-component objects of both biological and synthetic fragments in the 3-10 nanometre regimes, the aim is to study the structure and dynamics of well-defined functional objects that will lead to new applications. The focus is on three research topics:

1. Supramolecular  $\pi$ -conjugated assemblies.
2. Supramolecular polymers, helical aggregates and (bio)materials.
3. Supramolecular biomedical chemistry.

### *Quality*

The group has a world leading position in the design and synthesis of (macro)molecular precursors of functional supramolecular objects according to advanced non-covalent synthetic schemes. This extensive expertise is completed by a high capacity in characterization and applications either in life sciences or in materials. The successful integration of all the expertises in “one ensemble”, whose growth is limited by the “walls” of a departmental structure, has led to an organization deprived of artificial limitations: the TU/e Institute for Complex Molecular Systems (2008) in which the Macro-organic Chemistry group has a core position.

The programme director is a very prominent scientist, who is ranked in the top 100 of most cited chemists worldwide (since 2003) and is highly involved in national and international organizations and collaborations

### *Productivity*

In addition to numerous patent applications (2002-2007) filed by industrial partners, all the bibliometric indicators are high consistent with the high quality and productivity of the research despite of the broad field of activities. For instance, the crown indicator is 3.70+, which ranks the group at the level of top groups in the best US universities.

### *Relevance*

The highly relevant multidisciplinary knowledge and experience of the group are combined with socially relevant topics, such as energy, health and environment. A strong relationship between research and education of young students and researchers must be emphasized, and an active involvement in the outreach of science to the public at large, as well. Contacts with the industrial world are vivid and well-organized (via 2 start-up companies), not only for identifying fundamental issues on technologically relevant topics but also for commercializing the proprietary technology platform of supramolecular (bio)polymers.

### *Viability*

Viability is not a concern for a group which extends its vision and expertise beyond the frontiers of several departments, and generates enthusiasm and excitement in spite of a very demanding involvement.

### **Conclusion**

This worldwide renowned group has a unique capacity to grow while passing the institutional barriers and maintaining if not increasing, the scientific and societal impact of its activities.

## Molecular Materials and Nanosystems

Programme director:	Prof. dr. ir. R.A.J. Janssen
Research staff 2007:	21,11
Assessments:	Quality: 5
	Productivity: 5
	Relevance: 5
	Viability: 5

### *Short description*

The group aims at a coherent scientific research programme on the chemistry, physics and materials science of functional nanostructured molecular, polymer and hybrid materials, and nanosystems that may find application in photonic and electronic technologies. The mission is: the creation, organization, characterization and understanding of the functioning of molecular materials and nanostructures that can be assembled into larger (complex) architectures or devices and that exhibit novel physical properties and phenomena.

### *Quality*

An interdepartmental research group with expertise spanning from synthesis through optical spectroscopy and scanning probe techniques to the fabrication and testing of final device, this unit is successful in integrating the activities of a large number of chemists, chemical engineers and physicists towards the production of a high quality, relevant and important research, contributing significantly to their field.. The quality of the programme and the prominence of the director are testified by an increasing number of citations resulting in a high and steadily increasing crown indicator.

### *Productivity*

A very high number of publications, approximately half of them in the highest impact journals, a number of patents and a high number of PhD students indicate an excellent output..

### *Relevance*

The programme contains application-stimulated research spanning from the molecule to the material-system and from the basic phenomena to the device. Numerous collaborations with academic institutions and with industries as well as numerous invitations for lectures in conferences, tutorials and seminars testify to the relevance of the research performed by the group

### *Viability*

The research area is highly viable, the field being still in an expanding stage. The programme is also coherent with the defined priorities of TU/e. High external input of finances for research originate in a balanced way from agencies supporting fundamental science, agencies supporting application oriented work , and industries, and cover costs of most of the non-permanent staff. Judging from the successful history of the director in attracting research funds, the future potential is bright.

### **Conclusion**

This is a solid group with excellent output. A path for a yet further excellence would be to target entirely novel concepts and broaden fundamental innovations. Based on the prominence of the group as testified by all the indicators, the future plans outlined by the director are fully supported by the assessment committee.



## Supramolecular Polymer Chemistry

Programme director:	Prof. dr. R.P. Sijbesma
Research staff 2007:	5,3
Assessments:	Quality: 5
	Productivity: 5
	Relevance: 5
	Viability: 4

### *Short description*

The group aims to design, synthesize and characterize self assembled polymeric materials with functionality derived from structuring at the nanometre length scale, or from responsivity to molecular or mechanical stimuli. This mission reflects the two research areas defined within the group: (i) Nanostructured materials based on hydrogen bonded self-assembly and (ii) smart responsive materials. In the first area, hydrogen bonding is used as a well-defined non-covalent interaction to structure materials at the nanometre length scale. In the second research area, molecular recognition or mechanical stimuli induce changes in the properties of polymeric materials.

### *Quality*

This is a small new research group built by Prof. Sijbesma, a former member of the Macro-organic Chemistry programme, who continues his work on hydrogen-bonded supramolecular polymers and also develops new themes aiming at design and synthesis of mechano- and chemoresponsive polymer and supramolecular materials. In all these areas this is a world leading group with absolutely outstanding publication and citation record in the most prestigious journals. The impact of the work on supramolecular self-assembly by self-complementary hydrogen bonds is tremendous. Also the work on mechanochemistry of coordination polymers is first class and illustrates well both the scientific talent and good taste of the group leader for opening original and relevant research directions.

### *Productivity*

The academic productivity of this group is excellent and the publication and citation numbers speak for themselves. The number of PhDs produced could eventually be raised provided that there is adequate staffing.

### *Relevance*

The problems addressed by the group are central to the current development and future of materials based on supramolecular chemistry. The current projects, in particular those concerning supramolecular mechanochemistry or self-repair could open new technological avenues.

### *Viability*

Given the group leader's outstanding academic record and the excellent environment for functional material science at TU/e, there is every reason to believe that the group can remain a leader in the field of supramolecular and self-assembled polymers. The group is relatively small and desires not only to focus on fundamental research, but also to move towards more application-oriented projects. Such an evolution is sensible and future projects concerning functional materials sound very attractive. However, in order to be competitive and successful the group needs reinforcement.

### **Conclusion**

This programme created by a very motivated and talented scientist emerges as a leading effort in the very active and attractive field of the use of molecular recognition for bottom-up synthesis of new materials. The academic reputation of the group is excellent and the ambition of the programme to expand towards more applied projects is to be encouraged.

## Macromolecular Chemistry and Nanoscience

Programme director:	Prof. dr. U.S. Schubert	
Research staff 2007:	20,95	
Assessments:	Quality:	NA
	Productivity:	NA
	Relevance:	NA
	Viability:	NA

The mission of the laboratory is to combine synthesis and advanced characterization of self organizing functional materials and tailor-made complex macromolecules with selective deposition and micro-/nano-structuring methods of substrates. The ultimate aim is to approximate the perfection of natural systems both with respect to morphology and function, using synthetic systems. To be able to systematically vary the molecular parameters of the (supra)macromolecules and to identify quantitative structure-property relationships, parallel (microwave-assisted) synthesizer and combinatorial approaches in combination with high throughput screening methods have been incorporated into the scientific programme.

Since the director left TU/e and no interview with representatives of this programme was scheduled, this programme is not rated.

## Polymer Chemistry

Programme director:	Prof. dr. C.E. Koning	
Research staff 2007:	16,74	
Assessments:	Quality:	4
	Productivity:	5
	Relevance:	4
	Viability:	4

### *Short description*

The programme is concentrated on the synthesis of functional, bio-related and performance polymer systems. A variety of polymerization mechanisms and techniques is utilized, and optimized via detailed mechanistic studies. The ultimate goals of the group are to develop increasingly complex and demanding materials for advanced applications and to actively pursue sustainable resources and technologies through the use of Nature-inspired concepts and tools.

### *Quality*

When the former leader of the Polymer Chemistry (PC) group retired in 2000, the research activities – radical polymerisation and emulsion technology – were pursued independently by Prof. C.E. Koning, the new leader of the PC group, and Prof. A.M. van Herk, who headed a Functional Polymer Colloids and Radical Polymerization group. Prof. Koning extended the research effort to two additional polymerisation fields, i.e. step-growth polymerisation, which is an industrially relevant field with a lack of experts, and all types of polymerisation catalysis (homogeneous, heterogeneous and enzymatic). This ambitious programme led to significant contributions to the field of traditional polymerisation mechanisms and related materials. Breakthroughs in processes related to solid-state postcondensation, nanocomposite production and enzymatic polymerisation increased significantly the international visibility of the group.

### *Productivity*

As a whole, the productivity is excellent as assessed by the high quality of the papers and, after normalisation for group size, by a high number of patents and defended PhD theses.

### *Relevance*

The programme is conducted in close relationship with industry, which is the major sponsor of the research, mainly via the Dutch Polymer Institute (DTI). As a result, research contracts constitute at least 80% of the total funding. The PC group thus provides industry with the scientific and technological support that it needs, which is a mission expected from a University of Technology. This dual scientific and technical relevance of the research projects is emphasized by a good balance between patenting activity and scientific publication strategy, both of which are considered to be very good (cf. Supra).

### *Viability*

It is very challenging to push the research effort in depth when the research front is broad and the staff is limited. This possible threat for the future might be solved by the envisioned restructuring of the groups that constitute the Polymers and Composites sub-discipline. This reorganization would strongly consolidate the PC group by combining the groups of Prof. Van Herk and Dr. Goossens (now part of the Polymer Technology group). This restructuring would not only be beneficial to the long-term viability of a very pertinent research on the main industrial polymerisation mechanisms strongly driven by sustainability, but also to the proper balance between basic research and applied prospects.

### **Conclusion**

Although built on strong industrial connection, the programme of the PC group is well balanced, leading to a very good output in basic and applied science. The viability of the group, which is active on a broad research front, might be guaranteed in the future by the coherent integration of two groups with relevant expertise, which was announced to the Committee during the on-site visit.

## Polymer Technology

Programme directors:	Prof. P.J. Lemstra & Prof. D.J. Broer		
Research staff 2007:	14,8		
Assessments:	Quality:		4
	Productivity:		5
	Relevance:		5
	Viability:		NA

### *Short description*

The group aims to create and understand polymer structures in order to develop advanced polymer systems and devices (at demonstrator level) in a chain-of-knowledge approach. The programme covers three research themes: Plastics and Composites, Functional Polymers, and Bio-based and Bio-inspired Polymers. These themes utilize the same knowledge base involving thermodynamics, chemistry and physics.

### *Quality*

The programme has gained a rather unique and well deserved reputation as a leading group in polymer physics and technology and was highly visible both in industry and academia. The group's remarkable achievements are reflected in very successful collaborations with a wide network of industries, the patent portfolio, as well as impressive start-up spin-off activities. Research, both in traditional and emerging areas of polymer science, has been highly innovative. Work on enhancing life-time of artificial hips and knees, on panel displays, membranes, solar energy collectors and sensors are good examples. Also, some fundamental work of the group was of top quality and attracted a lot of attention. The concept of all-polymer composites, the papers on lowering the viscosity of polymer melts via dispersing of nano-sized silica and on heterogeneity in melts of crystallisable polymers could, for example, serve as wonderful illustrations of how industrially relevant research can bring new remarkable insight into polymer science.

### *Productivity*

The productivity of the group as measured by the number of publications, PhD theses, the number of filed patents and the success in creating quite a number of spin-off activities is excellent.

### *Relevance*

The group has worked on scientifically challenging projects of direct relevance to current and future industrial needs and has been able to implement a global innovative approach. The fruitful collaboration with not only big industrial companies which traditionally collaborate with universities, but also with small and medium size enterprises is absolutely impressive.

### *Viability*

Professor Lemstra, the head of the programme, will retire and the programme as such will be stopped.

## **Conclusion**

The programme has been essential for placing Eindhoven as an internationally leading centre of polymer research. It fostered a unique global approach where industrially relevant questions encouraged very innovative multidisciplinary fundamental science. The programme has been crucial to establish high quality education of students and researchers in the field. It is regrettable that this programme that combines traditional and emerging (functional) polymer materials fields and a unique application chain of knowledge oriented philosophy, is now being terminated. The departmental proposal to split the group and reinforce the Polymer Chemistry programme on the one hand and introduce some expertise in functional materials to develop application oriented projects in Supramolecular Polymer Chemistry on the other could be a very sensible alternative in this situation.

## Functional Polymer Colloids and Radical Polymerization

Programme director:	Prof. dr. A.M. van Herk
Research staff 2007:	4,34
Assessments:	Quality: 4
	Productivity: 5
	Relevance: 4
	Viability: 4

### *Short description*

The research programme is centred on the design and preparation of functional polymer (nano)particles, primarily using the free-radical technique of emulsion polymerization. The synthetic work is combined with detailed physical chemical studies on structure-property relationships and (controlled) radical mechanisms in homogeneous and heterogeneous systems. The ultimate goal of the programme is to develop increasingly complex materials for advanced applications while actively pursuing sustainable technologies.

### *Quality*

After the retirement of Prof. German, the former leader of the Polymer Chemistry group, in 2000, Prof. Van Herk maintained the expertise of this group by focusing on (controlled) radical polymerisation in emulsion from the mechanistic point of view and as a tool to prepare functional polymer colloids. The small size of the group that he headed during the evaluation period (2001-2007) can be accounted for by the dual role played by Prof. Van Herk as programme leader and Director of Education (60% of the time) in the department. His expertise in emulsion polymerisation is well established as assessed by an active role in the Dutch Foundation Emulsion Polymerization consortium and by invited and keynote lectures in international conferences.

### *Productivity*

The scientific productivity is excellent considering the size of the group, with a large number of PhD theses and the best bibliometric data in the Polymers and Composites departmental sub-discipline.

### *Relevance*

The research programme is not only scientifically relevant, but it also delivers sound technological information to the industry, which is a partner of the group (55% funding via research contracts).

### *Viability*

The viability of the group offers optimistic prospects for the future with the full availability of Prof. van Herk for research in 2009 and new lines of research by Dr. Heuts, who was appointed full-time professor in 2006. Moreover, this group is expected to participate actively in an enlarged Polymer and Technology group, together with the groups of Prof. Koning and Dr. H. Goossens, which would strengthen the desired long-term expertise on established polymerisation techniques and the large scope of related (nano/bio/hybrid) materials

### **Conclusion**

As a whole, the research activity of this group merits the qualification of “very good”, a significant achievement given a sub-critical size, and the sizeable time investment of its leader in the educational activity of the department., Prof. van Herk is now again fully available for research, and the integration of his group into an enlarged group devoted to Polymer Chemistry and Technology would make sense and would contribute effectively to the impact and viability of the departmental research activities in this broad field.

## Polymer Physics (Assessment report 2006)

Programme Leader:	Prof. Dr. M.A.J. Michels
Assessments:	Quality: 5
	Productivity: 4.5
	Relevance: 4.5
	Prospects: 4.5

### *Short description*

The activities of this group started in October 1998, when the programme leader was appointed as a full-time professor. The mission is to perform theoretical studies in the field of polymers and other soft materials. The main research programme is concentrated on the understanding of the relation between the molecular and microscopic structures of materials and the role of supramolecular order versus mesoscopic disorder. The three sub-programs are concerned with respectively electronic and electrooptical properties of conjugated molecules, the supramolecular order and structure development of self-organisation in macromolecular and polymeric systems, and the unravelling of polymer dynamics and the micromechanics of polymer deformation and fracture. The tools used are density-function theory, ab-initio calculations, molecular simulations, Monte-Carlo optimisation, etc. The group developed a broad range of excellent complementary numerical and theoretical skills which enabled it to build up many international interactions with leading scientist in the field. It contributed significantly to the field of polymer microstructure dynamics properties and established a prominent position in the Netherlands and internationally. The group participates in the KNAW Research Schools Polymer Technology Netherlands (PTN) and Eindhoven Polymer Laboratories (EPL), and is a member of the TU/e Center for NanoMaterials (cNM). It plays a prominent role in the technological top institute on polymers, the Dutch Polymer Institute (DPI).

### *Quality: 5*

The group has been able to build up an international reputation in domains such as parameter free ab-initio calculations, atomistic simulations, molecular dynamics, Monte-Carlo optimisation, Brownian and dissipative particle dynamics. Its theoretical skills are focused on novel organic materials with remarkable electrical and optical properties. The programme leader is highly regarded in the polymer science community, and has recently been appointed as Scientific Director of the Dutch Polymer Institute. He was member of the Boards of successive KNAW-recognised Research Schools. The group's programme has an impact which is above the world average (CPP/FCSm = 1.40), and many papers are published in highly rated journals in the period until 2003.

### *Productivity: 4.5*

The group was not yet in existence at the start of the current evaluation period, and in the beginning most senior staff held research positions outside the TU/e. They have however been able to generate an important scientific output of 84 (82) SCI papers for a total research staff of about 37 since 1997 ( $N^{\circ}$ papers/fte = 2.30). This is an excellent result and matches the highest value in the Department of Applied Physics. The number of PhD theses (4) is rather low which is, according to the programme leader, in part 22 23 due to the less attractive nature of theoretical physics at the TU/e. The group relies mainly on funding by DPI which resulted in a spectacular increase of external funding from 11% (1997) to 58% (2003). Funding by NWO is lagging behind but growing; EU funding is still absent.

### *Relevance: 4.5*

The group strongly focusses on problem oriented research and proved its capabilities to create fundamental breakthroughs while active in application fields. The scientific and industrial climate is currently excellent for application inspired research on organic materials, with inroads in nanotechnology. Indeed, conjugated organic oligomer and polymer materials are being increasingly considered for incorporation as the active semiconductor elements in devices such as LEDs, photovoltaic cells, or field-effect transistors (FETs). In the operation of these devices, electron-transfer and energy-transfer processes play a key role, for instance in the form of charge transport, energy transport,

charge separation, or charge recombination. However, low charge mobility compared to single-crystalline silicon, limit the range of applications envisioned for organics. Organic electronics is probably not meant to replace traditional silicon electronics, but rather to complement it and extend its capabilities.

*Vitality/Prospects: 4.5*

Progress in organic electronics is likely to closely follow advances in our understanding of the fundamental properties of organic materials. The underlying science is exciting: weak intermolecular interactions, low dielectric constants, and the presence of disorder are characteristics that make organic semiconductors distinctive systems for exploring a variety of solid-state phenomena. Disorder strongly affects the transport properties of organic semiconductors insofar as it can localise charges and excitons on lattice sites. That is sometimes used to good effect e.g. in thin-film LEDs, but is problematic for devices such as FETs that require high charge mobility to work well. The group has an interesting position for application-inspired research on organic materials, with possible extension in nanotechnology and life sciences. The availability of an unlimited number of different molecules represents the ultimate freedom for the theorist and the interesting challenge for the experimentalist. The current interest in polymer electronics is high, but could decrease substantially if applications are absent in the near future. Finally, the shift in polymer research towards physics, and the growing potential and interest for predictive computing is an important asset for the future activities of the group.

**Conclusion**

The group is very well positioned to achieve its aims of becoming an internationally leading theory group on soft matter. An eventual shift from polymer to nano-organic materials and from synthetic polymers to polymers and colloids may produce promising results but should be evaluated carefully in the framework of the FMN Cluster at TU/e. The Committee congratulates the programme leader for his recent appointment as Scientific Director of the DPI, but expresses its concern for the possible impact on the future activities of the group. Urgent measures should be taken to strengthen the group organisation.

## **Polymer Technology**

Programme director	Prof. dr. ir. H.E.H. Meijer
Research staff 2006	2.6 tenured, 13.7 total fte
Assessments:	Quality: 5
	Productivity: 5
	Relevance: 5
	Viability: 5

The programme includes research on a number of important aspects of polymer science: structure development in flow, structure-property relations and mechanical properties.

### *Quality*

This programme is internationally recognized as one of the top polymer science institutes in the world.

### *Productivity*

The productivity of this group is excellent. The publication and citation numbers speak for themselves.

### *Relevance*

The problems addressed by this group are all central to the current development of polymer science.

### *Viability*

Given that this group has maintained a first-rank international reputation in polymer science for more than a decade, and that they have demonstrated very good judgment on their choices of research topics, there is every reason to believe that the group will remain at the forefront of the field.

### **Conclusion**

This group is one big reason that Eindhoven is an international centre of polymer research.



### APPENDIX 3: Publication records

For all output dissertations, publications, books and book chapters of 2008 and other years see:

1: Macro-organic & Bio ST&BMT	<a href="http://yp.chem.tue.nl/pubinsection.php/all/7/2008">http://yp.chem.tue.nl/pubinsection.php/all/7/2008</a>
2: Molecular Mat. & Nano ST&N	<a href="http://yp.chem.tue.nl/pubinsection.php/all/9/2008">http://yp.chem.tue.nl/pubinsection.php/all/9/2008</a>
3: Supramolecular Polymer Chemistry ST	<a href="http://yp.chem.tue.nl/pubinsection.php/all/28/2008">http://yp.chem.tue.nl/pubinsection.php/all/28/2008</a>
4: Macromol. Chem. & Nano ST	<a href="http://yp.chem.tue.nl/pubinsection.php/all/8/2008">http://yp.chem.tue.nl/pubinsection.php/all/8/2008</a>
5: Polymer Chemistry ST	<a href="http://yp.chem.tue.nl/pubinsection.php/all/10/2008">http://yp.chem.tue.nl/pubinsection.php/all/10/2008</a>
6: Polymer Technology Group ST	<a href="http://yp.chem.tue.nl/pubinsection.php/all/12/2008">http://yp.chem.tue.nl/pubinsection.php/all/12/2008</a>
7: Polymer Physics N	<a href="http://yp.phys.tue.nl/pubinsection.php/all/18/2008">http://yp.phys.tue.nl/pubinsection.php/all/18/2008</a>
8: Polymer Technology W	<a href="http://yp.wtb.tue.nl/pubinsection.php/all/1/2008">http://yp.wtb.tue.nl/pubinsection.php/all/1/2008</a>
9. Soft Tissue Biomech. BMT	<a href="http://yp.bmt.tue.nl/pubinsection.php/all/3/2008">http://yp.bmt.tue.nl/pubinsection.php/all/3/2008</a>

#### Publications:

	2002	2003	2004	2005	2006	2007	2008	total
1: Macro-organic & Bio ST&BMT	25	33	35	47	49	51	42	<b>282</b>
2: Molecular Mat. & Nano ST&N	25	27	27	28	39	32	37	<b>215</b>
3: Supramolecular Polymer Chemistry ST	6	10	5	10	12	7	9	<b>59</b>
4: Macromol. Chem. & Nano ST	18	42	51	46	43	44	45	<b>289</b>
5: Polymer Chemistry ST	37	53	44	55	42	40	25	<b>296</b>
6: Polymer Technology Group ST	29	39	54	63	57	38	45	<b>325</b>
7: Polymer Physics N	16	20	28	20	24	14	23	<b>145</b>
8: Polymer Technology W	22	21	28	20	23	19	37	<b>170</b>
9. Soft Tissue Biomech. BMT	15	37	21	32	27	15	21	<b>168</b>
<b>Total</b>	<b>193</b>	<b>282</b>	<b>293</b>	<b>321</b>	<b>316</b>	<b>260</b>	<b>284</b>	<b>1949</b>

#### Citations:

Macro-Organic Chemistry and Biomedical Chemistry Group; Jan. 12, 2009

name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
E.W. Meijer	<b>534</b>	44	33	55	46	44	30	<b>19353</b>	1190	1111	733	<b>70</b>
M.H.P. v. Genderen	<b>99</b>	3	7	8	1	3	-	<b>722</b>	211	117	73	<b>13</b>
M. Merckx	<b>48</b>	-	3	5	5	18	8	<b>699</b>	235	37	33	<b>15</b>
A.P.H.J. Schenning	<b>157</b>	17	20	20	19	16	13	<b>4617</b>	470	249	167	<b>36</b>
J.A.J.M. Vekemans	<b>82</b>	5	4	2	9	5	2	<b>2104</b>	260	138	131	<b>24</b>
A.R.A. Palmans	<b>60</b>	5	2	7	10	10	5	<b>704</b>	131	68	52	<b>15</b>
P.Y.W. Dankers	<b>19</b>	3	1	3	3	4	4	<b>142</b>	46	30	20	<b>7</b>

**Citations:**

Molecular Materials and Nanosystems Group; Jan. 07, 2009

name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
R.A.J. Janssen	<b>308</b>	19	17	21	27	21	25	<b>9218</b>	1104	196	192	<b>49</b>
C.F.J. Flipse	<b>57</b>	3	0	1	6	2	3	<b>1151</b>	84	78	77	<b>19</b>
M. Kemerink	<b>50</b>	4	5	6	3	4	8	<b>521</b>	81	80	63	<b>11</b>
S.C.J. Meskers	<b>116</b>	11	11	7	15	16	10	<b>2426</b>	116	120	91	<b>28</b>
M.M. Wienk	<b>47</b>	5	4	6	8	4	5	<b>1648</b>	196	192	153	<b>22</b>

Supramolecular Polymer Chemistry Group; Jan. 13, 2009

name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
R.P. Sijbesma	<b>112</b>	10	5	10	12	7	12	<b>5238</b>	733	504	488	<b>34</b>

Macromolecular Chemistry and Nano-Science Group; Jan. 16, 2009

name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
U.S. Schubert	<b>308</b>	42	51	46	43	44	45	<b>5824</b>	174	170	166	<b>41</b>

Polymer Chemistry Group; Jan. 30, 2008

name	total publ	publ. last 6 years						total cit	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
Cor Koning	<b>176</b>	11	8	21	16	18	18	<b>1209</b>	190	76	48	<b>18</b>
Alex van Herk	<b>152</b>	9	8	14	7	8	1	<b>1400</b>	280	76	60	<b>26</b>
Hans Heuts	<b>58</b>	8	1	3	2	1	1	<b>1501</b>	247	190	121	<b>20</b>
Bert Klumperman	<b>98</b>	5	12	8	9	3	3	<b>2348</b>	395	108	100	<b>27</b>
Rob Duchateau	<b>71</b>	2	5	4	7	7	7	<b>2029</b>	124	119	107	<b>26</b>
John Chadwick	<b>67</b>	2	5	5	9	8	4	<b>792</b>	113	77	55	<b>16</b>

Polymer Technology Group – ST; Jan. 30 2008

Name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
Piet Lemstra	<b>154</b>	7	5	6	7	3	1	<b>3749</b>	423	252	181	<b>33</b>
Dick Broer	<b>143</b>	6	10	19	11	8	11	<b>2675</b>	255	236	149	<b>26</b>
Cees Bastiaansen	<b>106</b>	5	5	13	9	5	7	<b>1561</b>	145	85	84	<b>22</b>
Sanjay Rastogi	<b>88</b>	4	7	8	8	5	7	<b>1169</b>	111	82	77	<b>19</b>
Ton Peijs	<b>87</b>	3	4	1	4	13	9	<b>1010</b>	78	59	48	<b>18</b>
Joachim Loos	<b>124</b>	3	11	19	22	15	8	<b>1828</b>	200	153	90	<b>23</b>
Erik Nies	<b>52</b>	1	0	3	3	3	5	<b>447</b>	39	38	31	<b>13</b>
Han Goossens	<b>46</b>	5	3	8	3	4	9	<b>406</b>	61	45	44	<b>12</b>
Laurent Nelissen	<b>16</b>	1	0	0	1	0	0	<b>103</b>	17	16	11	<b>7</b>

**Citations:**

Polymer Physics Group | Jan 13, 2009

name	total publ.	publ. last 6 years						total # cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
M.A.J. Michels	<b>53</b>	12	11	11	10	6	3	<b>1238</b>	200	90	80	<b>19</b>
P.A. Bobbert	<b>26</b>	4	5	6	3	4	4	<b>828</b>	88	71	71	<b>17</b>
A.V. Lyulin	<b>24</b>	2	5	4	4	5	4	<b>330</b>	48	33	28	<b>12</b>
P. v.d. Schoot	<b>37</b>	7	8	5	8	2	7	<b>530</b>	92	77	30	<b>13</b>

Polymer Technology-W Group; Febr. 09, 2009

name	total publ.	publ. last 6 years						total # cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
Han Meijer	<b>161</b>	12	11	11	13	7	8	<b>2576</b>	141	88	83	<b>28</b>
Gerrit Peters	<b>114</b>	11	10	8	11	4	14	<b>1266</b>	61	60	59	<b>20</b>
Leon Govaert	<b>55</b>	8	8	5	2	2	7	<b>706</b>	56	50	39	<b>17</b>
Martien Hulsen	<b>40</b>	2	3	2	4	4	4	<b>614</b>	115	77	57	<b>14</b>
Piet Schreurs	<b>46</b>	2	6	5	3	4	5	<b>448</b>	59	38	37	<b>12</b>
Patrick Anderson	<b>48</b>	3	2	3	9	8	9	<b>298</b>	30	26	25	<b>10</b>

Soft Tissue Biomechanics & Tissue Engineering Group; Jan. 13, 2009

name	total publ.	publ. last 6 years						total cit.	# cit. 3 best publ.			h-index
		'03	'04	'05	'06	'07	'08					
Frank Baaijens	<b>130</b>	28	12	11	10	7	14	<b>2014</b>	95	72	61	<b>26</b>
Carlijn Bouten	<b>65</b>	13	5	11	6	12	7	<b>1129</b>	154	112	100	<b>19</b>
Cees Oomens	<b>61</b>	11	6	7	6	5	8	<b>691</b>	62	60	44	<b>15</b>
Anita Mol	<b>17</b>	2	2	4	4	3	2	<b>662</b>	135	27	25	<b>7</b>
Daisy van der Schaft	<b>21</b>	3	2	2	1	2	2	<b>359</b>	58	51	39	<b>12</b>

#### **APPENDIX 4: Board decision**

In “Het Instellingsplan 2009 – 2012”, we read on page 25 under the heading DPI and ESI: “ *De TU/e wil haar positie als preferred partner van het “Dutch Polymer Institute” (DPI) en het “Embedded Systems Institute” (ESI) de komende jaren versterken. Beide private technologische topinstituten zijn geïnitieerd vanuit de TU/e, zijn gevestigd op de universiteitscampus en hebben een nauwe bestuurlijke en wetenschappelijke band met de universiteit. DPI heeft als missie: “The design of novel and/or improved polymeric materials and products through an integrated, multidisciplinary, chain-of-knowledge approach and a profound understanding of the involved disciplines.” Het is de missie van ESI: “To advance industrial innovation and academic excellence in embedded systems engineering”. Ambitie is dat een belangrijk deel van het onderzoek onder de vlag van beide instituten aan de TU/e plaats zal vinden.*”.

Apart from these clear choices, especially the decision of the board of the TU/e to start funding the ICMS, Institute of Complex Molecular Systems, clearly illustrates that the board of the TU/e recognizes the importance of polymers for the TU/e.

**APPENDIX 5: Details about all the 9 EPL groups, their Postdocs and PhD's:  
Gender, Study Efficiency and Jobs**

**Group Macro-Organic Chemistry – ST (Bert Meijer)**

Post-doctoral fellows	Job2	F/M
Dr. R. Kleppinger	DSM , X-ray lab, NL	
Dr. M. Masuda	NARC, Japan	
Dr. M.R. Craig	CIBA, New York	
Dr. A. Gesquière	<i>University of Florida, Assistant Prof.</i>	
Dr. M. Garcia Martin	Esteve Quimica, Spain	F
Dr.ir. A.R.A. Palmans	<i>TU/e, assistant prof.</i>	F
Dr. A.J. Wilson	<i>University of Leeds, ass. prof.</i>	
Dr. H. Ohkawa	Bio Loop, Japan	
Dr. H.M. Keizer	SyMO-Chem, Eindhoven NL	
Dr. S. Dudek	E-ink, Cambridge, UK	
Dr. H. Kautz	Evonik Degussa , Marl, Germany	
Dr.ir. A.T. ten Cate	TNO , Eindhoven, NL	F
Dr. S.H.M. Sontjens	SyMO-Chem, Eindhoven, NL	
Dr. J.R. Matthews	Corning Technologies, Corning. USA	
Dr. I.O. Shklyarevskiy	Oce Technologies, BV NL	
Dr. O.A. Scherman	<i>University of Cambridge, ass. prof</i>	
Dr. S.J. George	<i>JNCASR, Bangalor, India, faculty fellow</i>	
Dr. D. Gonzalez Rodriguez	<i>Universidad Autonoma de Madrid, ass. prof</i>	
Dr. H. Katayama	Nitto Denko Corp, Osaka, Japan	
Dr.ir. P. Jonkheijm	<i>University Twente, ass. prof.</i>	
Dr. Z. Tomovic	Elastogran GmbH/BASF, Germany	
Dr. C. Lee	Novartis, Cambridge, USA	
Dr. R. Martin	ICIQ, Tarragona, Spain	
Dr. T. Baughman	DSM Research, Geleen, NL	
Dr. C.R.G. Grenier	Plextronix, Pittsburg, USA	
Dr. E.J. Foster	Adolf Merckl Inst., ass prof	
Dr. R. Matmour	Society Michelin	
Dr. S. Deshpande	Postdoc in India IIT Mombay	F

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. F.S. Precup	unknown		F	x		
Dr. H.M. Keizer	Postdoc Gainesville, FLA, USA	SyMO-Chem		x		
Dr.ir. J.J. van Gorp	TU/e post-doc	Dupont, USA	F	x		
Dr.ir. A.T. ten Cate	TU/e post-doc	TNO	F	x		
Dr. ir. R.A. Koevoets	TU/e post-doc	Oce				
Dr. ir. P. Jonkheijm	<i>Uni. Twente ass. prof</i>			x		
Dr. ir. W.J. Soer	PhD group Koning	DSM Waalwijk				
Dr.ir. F.J.M. Hoeben	SyMO-chem			x		
Dr. R.W. Sinkeldam	<i>University of California, San Diego</i>			x		

Dr. ir. G.B.W.L. Ligthart	DSM, Geleen			x		
Dr.ing. J. van Herrikhuizen	Eurotape B.V, Soest			x		
Dr.ir. T.F.A. de Greef	ICMS, TU/e,			x		
Dr. R. Abbel MSc	TNO, Eindhoven			x		
Dr.ir. M.M.J. Smulders	Postdoc Cambridge			x		
Dr.ir. P.G.A. Janssen	DSM, Geleen			x		

### Group Biomedical Chemistry – BMT (Bert Meijer)

Post-doctoral fellows	Job2	F/M
Dr. P.M. Andreoli	consultant	
Dr. J.G. Linhardt	Bausch & Lomb, Inc., NY, USA	
Dr. Q. Sun	ECN Petten	
Dr. ir. E.G. Funhoff	Novartis Basel	
Dr. T.C. Chang	Organic Technologies Corning Incorporated, USA	F
Dr. A. Dirksen	The Scripps Research Institute	F
Dr.ir. S. Söntjes	SyMO-Chem, Eindhoven. NL	
Dr. M.A.C. Broeren	Maxima Medisch Centrum, Veldhoven	F
Dr. E. Pouget	<i>University of Bordeaux as fellow</i>	F
Dr. B. Helms	Lawrence Berkeley National Lab Molecular Foundry	
Dr. M.V. Golynskiy	<i>University of Minnesota, ass. prof.</i>	
Dr. Y. Kamikawa	Oreal, Japan	F
Dr. M. Malisauskas	Novartis Switzerland	

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. J.J.J.M. Donners	Ethicon, Johnson & Johnson, USA			x		
Dr. M.J. Boerackers	DSM, Geleen			x		
Dr. F. Brustolin	Friesland Coberco Dairy Foods		F	x		
Dr. S. Langereis	Philips Research Laboratories, Eindhoven			x		
Dr. ir. M.A.C. Broeren	Maxima Medisch Centrum			x		
Dr.ir. D.C. Popescu	Oce-Technologies B.V.		F	x		
Dr. H. Malda	DSM NeoResins, Waalwijk		F	x		
Dr. P.Y.W. Dankers	<i>UMCG, Groningen</i>	<i>TU.e, ass. prof.</i>	F	X		
Dr. M.R.J. Vos	FEI Company, Eindhoven			x		
Dr. T.H. Evers	Philips Research			x		
Dr. E.M.W.M.v.Dongen	Fuji film, Tilburg		F	x		
Dr. ir. B. van As	Océ Technologies, BV			x		
Dr. ir. E. Wisse	DSM Research, Geleen		F	x		
Dr. r. I. van Baal	Schering Plough		F	x		
Dr. ir. K.P. van den Hout	Fontys Hogeschool		F	x		
Dr.ir. S. Reulen	LEAD Pharma		F			

## Group Molecular Materials And Nanosystems – ST (Rene Janssen)

Post-doctoral fellows	Job2	F/M
Dr. S. Meskers	TU/e, ST, assoc. prof.	
Dr. C. Martineau	Servier (F)	F
Dr.ir. M. Struijk	ChemShop	
Dr.ir. M. Wienk	TU/e, ST, ass. prof.	
Dr.ir. P. van Hal	Philips Research	
Dr. C. Radano	Evonik RohMax (USA)	
Dr. N. Sturh-Hansen	Univ. Copenhagen, post-doc	
Dr. M. Turbiez	Ciba/BASF (CH)	
Dr. A. Popa Merticaru	Heineken	F
Dr.ir. W. Beek	postdoc, Univ. Cambridge (UK)	
Dr.ir. E. Neuteboom	CW-NWO	F
Dr. S. Chopin	postdoc, University Nantes (F)	F
Dr. Y. Nicolas	Maître de conf. Univ. Bordeaux 1 (F)	
Dr.ir. W. Stouwdam	ASML	
Dr. J. Piris	postdoc, TU Delft	
Dr. C. Nielsen	Coloplast (DK)	
Dr. R. Ashraf	postdoc, Imperial College London (UK)	
Dr. N. Hergué	postdoc, Univ. Mons-Hainaut (B)	F

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
				x		
Dr.ir. P. van Hal	postdoc TU/e	Philips Research		x		
Dr. P. v. Meurs	MerkaChem BV		F	x		
Dr. A. Marcos	TNO	Postdoc Dortmund	F	x		
Dr.ir. J. van Duren	NanoSolar (USA)			x		
Dr.ir. E. Neuteboom	AMOLF	TU/e postdoc	F	x		
Dr.ir. W. Beek	postdoc TU/e	Un. Cambridge UK		x		
Dr.ir. E. Beckers	TNO			x		
Dr.ir. T. Offermans	postdoc Mons (B)	CSEM (CH)		x		
Dr. D. Wasserberg	postdoc Dortmund (D)	postdoc U. Twente	F	x		
Dr. J. v. Herrikhuyzen	Eurotape			x		
Dr.ir. F. Verbakel	Philips			x		
Dr. D. Veldman	ECN				x	
Dr. P. Chin	NKI (Amsterdam)			x		
Dr. G. Lakhwani	postdoc Univ. Texas (USA)			x		
Dr. A. Zoombelt	postdoc Stanford (USA)			x		

**Group Molecular Materials And Nanosystems – TN (Rene Janssen)**

<b>Post-doctoral fellows</b>	<b>Job2</b>	<b>F/M</b>
Dr. J.M. Wulverick	European patent office	
Dr. M. Fonrodona	Ciba/BASF (CH)	F
Dr. J. Liang	postdoc Univ. Paris (F)	
Dr. T. Hanrath	<i>ass. prof. Cornell (USA)</i>	

<b>PhD students</b>	<b>Job1</b>	<b>Job2</b>	<b>F/M</b>	<b>Duration PhD #years</b>		
				4	<5	>5
J. Amir, M. Sc.	ASML					x
Dr. G. Tanasa	ASML					x
Dr. H. Gommans	IMEC (B)	Philips			x	
Dr. C. Popa	PD Humboldt Universität zu Berlin (D)		F		x	
Dr.ir. R. Willems					x	
Dr.ir. J. Hagelaar	Philips Lighting				x	
Dr.ir. R. v. Laarhoven	ASML				x	
Dr. J. Cervenka	Czech National Research Institute (CZ)				x	
N. Podaru, , M. Sc.	High Voltage Engineering Europa					
Dr. A. Nardes	postdoc Univ. Denver (USA)					x
Dr. D. Charrier	postdoc Univ. Poitiers (F)			x		
Dr.ir. S. v. Mensfoort	Philips Lighting			x		



**Group Supramolecular Polymer Chemistry – ST (Rint Sijbesma)**

<b>Post-doctoral fellows</b>	<b>Job2</b>	<b>F/M</b>
Dr. M. Masuda	Nanoarchitectonics Research Centre NARC	
Dr. N. Chebotareva	Ciba, Switzerland	F
Dr. A.J. Wilson	University of Leeds, postdoc	
Dr. H. Ohkawa	Bio-Loop Takatsuki, Osaka	
Dr. H.M. Keizer	SyMO-Chem, Eindhoven	
Dr. O.A. Scherman	<i>University of Cambridge, ass. prof.</i>	
Dr.ir. A.T. ten Cate	TNO, Eindhoven	F
Dr. H. Kautz	Evonik Degussa GmbH	
Dr. E. Menozzi	Ciba, Italy	
Dr. T. Felder	Lab für Analytik und Metabolismus-Forschung Service	
Dr. I. Tomatsu	University of Leiden, Post doc	
Dr. A. Piermattei	DSM Research Geleen	
Dr. J.L. Wietor	DuPont Performance Coatings, Belgium	
Dr. J. Flapper	Postdoc University of Melbourne	

<b>PhD students</b>	<b>Job1</b>	<b>Job2</b>	<b>F/M</b>	<b>Duration PhD #years</b>		
				4	<5	>5
Dr.ir. A.T. ten Cate	Postdoc TU/e	TNO	F	X		
Ir. R.A. Koevoets	Océ-Technologies BV			x		
Ir. G.B.W.L. Ligthart	DSM Research, Geleen			x		
Ir. J.M.J. Paulusse	UCSB, postdoc	<i>LUW, ass. prof</i>		x		
Ir. N. Botterhuis	TNO, Eindhoven		F	x		
Ir. T.F.A. de Greef	ICMS, TU/e			x		
Ir. D.J.M. van Beek	SABIC Europe		F	x		

**Group Macromolecular Chemistry And Nanoscience – ST (Ulrich S. Schubert)**

<b>Post-doctoral fellows</b>	<b>Job2</b>	<b>F/M</b>
Dr. Nikhil Singha	First TNO, later not known	
Dr. Stefan Schmatloch	Postdoc in Austria	
Dr. Huiqui Zhang	NN	
Dr. Alexander Alexeev	50% Postdoc TU/e, 50% NT-MDT	
Dr. Zhihui Yin	NN	
Dr. Elisabeth Holder	<i>ass. prof. Wuppertal</i>	F
Dr. Berend Jan de Gans	Evonik, Germany	
Dr. Yunkian Zhang	NN	
Dr. Nico Adams	Cambridge University	
Dr. Frank Wiesbrock	<i>ass. prof. Gratz, Germany</i>	
Dr. Harald Hofmeier	Postdoc University Groningen	
Dr. Dennis Abrazehvich	NN	
Dr. Dmitry Kozodaev	NT-MDT Eindhoven	
Dr. Stefanie Höppener	Postdoc FSU Jena, Germany	F
Dr. Andriy Kyrylyuk	NN	
Dr. Mircea Rasa	Oce Technologies BV	
Dr. Bas Lohmeijer	BASF, Germany	
Dr. Daan Wouters	IMEC Eindhoven	
Dr. Richard Hoogenboom	<i>ass. prof. Gendt</i>	
Dr. Patrick Smith	Research Group in Freiburg, Germany	
Dr. Matthias Lobert	Evonik, Germany	
Dr. Andres Winter	Postdoc TU/e	
Dr. Michael Meier	<i>ass. prof. Potsdam, Germany</i>	
Dr. David Fournier	Postdoc France	
Dr. Daniel Egbe	Postdoc Lintz, Germany	
Dr. Laszlo Majoros	JRC European Commission	
Dr. Jürgen Vitz	Postdoc FSU Jena, Germany	
Dr. Oana Schramm	NN	F
Dr. Georg Pavlov	Postdoc TU/e, working at FSU, Germany	
Dr. Carlos Guerrero	CIRO Australia	
Dr. Martin Hager	Postdoc FSU, Jena	
Dr. Emine Tekin	Postdoc UK, later housewife	F
Dr. Andreas Winter	Postdoc TU/e, Eindhoven	

<b>PhD students</b>	<b>Job1</b>	<b>Job2</b>	<b>F/M</b>	<b>Duration PhD #years</b>		
				4	<5	>5
				x		
Dr. Harald Hofmeier	Postdoc TU/e	P Groningen		x		
Dr. Philip Andres	NN				x	
Dr. Bas Lohmeijer	Postdoc TU/e	BASF		x		
Dr. Daan Wouters	Postdoc TU/e	IMEC		x		
M.Sc. A.A. Precup	<i>discontinuation</i>					
Dr. Hoogenboom	Postdoc TU/e	Fellowship Humboldt, Aachen, Germany		x		
Dr. Michael Meier	Postdoc TU/e	Group		x		
Dr. Veronica Marin	NN		F	x		
M.Sc. Issam Lazraq	<i>discontinuation</i>	PhD in France				
Dr. Carlos Guerrero	Postdoc TU/e	CIRO Australia		x		
Dr. Emine Tekin	Postdoc TU/e	Company UK	F	x		
M.Sc. Tina Guo Wei	<i>discontinuation</i>		F			

Dr. Manuela Chiper	Postdoc TU/e	PD CMAT Belgium	F	x		
Dr. Christina Guerrero-Ott	Postdoc TU/e	CIRO Australia	F	x		
Dr. Hans Kranenburg	Postdoc TU/e SMN	PD TU/e SMG		x		
M.Sc. Christoph Ulbricht	Defense on 11.17.2009					x
Dr. Jolke Perelaer	Postdoc TU/e	PD FSU, Jena		x		
Dr. Remzi Becer	Postdoc FSU	PD Worwick UK		x		
Dr. Tina Erdmenger	Just finished PhD		F	x		
M.Sc. Hector Tello Manon	<i>discontinuation</i>	PhD TU/e SPC				
Dr. Claudia Hänsch	Just finished PhD		F	x		
M.Sc. Kösters Parker	<i>discontinuation</i>					
M.Sc. Seda Cantekin	<i>discontinuation</i>	PhD TU/e SMO	F			

## Group Polymer Chemistry – ST (Cor Koning)

Post-doctoral fellows	Job2	F/M
Dr. P. Kelemen		
Dr. J. Severn	Borealis	
Dr. S. Mulder	Avantium	F
Dr.ir. S.C.J. Pierik	Teijin	
Dr. N. Gogibus	Huntsman	
Dr. R. Sablong	TU/e postdoc	
Dr. J.H. van Steenis	Synthomer	
Dr. J. Urban	<i>Czech University</i>	
Dr. D. Cummins	DSM Research Geleen	
Dr. M. Caipa	University Santa Barbara postdoc	F
Dr. G. Henry	TOTAL	
Dr. J. Canadell Ayats	TU/e postdoc	F
Dr. M. de Geus	DOW	

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. M. Adamy	Rhodia		F			
Dr. C. Beyers	BASF			x		
Dr. R. Bussels	LVM			x		
Dr. M.L.H. Pepers	BASF			x		
Dr. J. Pusch	TOHO				x	
Dr. R. Venkatesh	BASF			x		
Dr. R.X.E. Willemse	Oce Technologies BV				x	
Dr. K. Garkhail	General Electric		F	x		
Dr. R. Mosia	Sasol		F		x	
Dr. D. Suwier	BASF			x		
Dr. D. Tillier	Sabic		F	x		
Dr. W.J. van Meerendonk	DSM Research Geleen				x	
Dr. A.J.M. van Dijk	ASML			x		
Dr. M.P.B. Staal	BASF			x		
Dr. B.B.P. Staal	BASF			x		
Dr. E.H.D. Donkers	DOW		F	x		
Dr. D.J. Voorn	BASF	Fluor Daniel		x		
Dr. M. Smit	CHC		F	x		
Dr. J. Bozovic	General Electric		F	x		
M.Sc. S. Perin	<i>failed</i>		F			
Dr. M. de Geus	Postdoc ESPCI	EMPA (CH)		x		
Dr. J. Leswin	BASF			x		
Dr. J. Devroede	<i>University NSW</i>			x		
Dr. N. Grossiord	Post-doc Warwick	TNO	F	x		
Dr. B.A.J. Noordover	DOW				x	
Dr. J.R.I. Knoop	WUR					x
Dr. P.A.P. Geelen	Interpolymer		F	x		
Dr. R. Huang	Elocoat			x		
Dr. S. Huijser	Organon		F		x	
Dr. M.C. Hermant	<i>Flinders University</i>		F	x		

### Group Polymer Technology Group – ST (Piet Lemstra)

Post-doctoral fellows	Job2	F/M
Dr. F. Picchioni	<i>University of Groningen, associate prof</i>	
Dr. A. Ramzi	University of Utrecht, postdoc	
Dr. U. Agarwal	Reliance Industry, India	
Dr. B. Kim	Korea	
Dr. V. Vaenkatesan	ASML	
Dr. C. Gu	unknown	
Dr. J. Vega Borrego	<i>University of Madrid, ass. prof</i>	
Dr. C. Sanchez	<i>University of Zaragoza, ass. prof</i>	
Dr. M. Escuti	<i>University of North Carolina, ass. prof.</i>	
Dr. K. Harris	NINT Nano Institute Alberta	
Dr. B. Alcock	Johnson, England	
Dr. X. Zheng	<i>University in China, ass. prof.</i>	F
Dr. A. Terry	Diamond, UK	F
Dr. D. Beylov	University of Utrecht, postdoc	
Dr. M. Debije	<i>TU/e, ass. prof.</i>	
Dr. Lan Li	University in Germany	F
Dr. C. Harrats	University in Belgium	
Dr. L. Xue	TU/e, postdoc	F
Dr. W. Dong	<i>University in China, ass. prof</i>	
Dr. Z. Jiang	University in China	F

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
				x		
Dr. M. de Graaf	DOW			x		
Dr. D. Versteeg	Eques Oss			x		
Dr. M.C.W. van Boxtel	AKZO Nobel Coatings		F	x		
Dr. F. v.d. Burgt	GE Plastics	Sabic IP			x	
Dr. A. Rastogi, M.Sc.	Univ. Freiburg			x		
Dr. T. Schimanski, M.Sc.	Auto-Ind. Munchen			x		
Dr. S. Karanam, M.Sc.	GE Plastics	Sabic IP			x	
Dr. V. Margon, M.Sc.	Slovenia			x		
Dr. E. Snijders	TNO			x		
Dr. M.Tian, M.Sc.	NDT			x		
Dr. D. Trimbach	Univ. Jena					x
Dr. L. Xue, M.Sc.	TU/e postdoc		F		x	
Dr. S. Jain, M.Sc.	BASF			x		
Dr. M. Jansen	PTG				x	
Dr. F. Karssenbergh	Shangai	Akzo Nobel		x		
Dr. M. Prusty, M.Sc.	BASF			x		
Dr. M. Ziari, M.Sc.	Shell		F			x
Dr. S. Varghese, M.Sc.	Univ. Cochin				x	
Dr. M. Rajan MSc	India		F		x	
Dr. N. Kukaleykar, M.Sc.	DSM Research Geleen				x	
Dr. M. van der Mee	Sabic IP				x	
Dr. C. van Heesch	Philips Research			x		
Dr. J. Valetton	Own company: Neodec			x		
Dr.ir.R. Penterman	Philips Research			x		
Dr. H. Bos	Akzo Nobel		F	x		
Dr. M. Diepens	<i>still waiting for a job</i>		F		x	
Dr. B. Serrano-Ramon,	<i>still waiting for a job</i>		F	x		
Dr. E. Vinken	Dolphys TU/e		F	x		
Dr. L. Balzano, M.Sc.	Postdoc MaTe/ TU/e			x		

Dr. I. Cotiuga, M.Sc	Latexfalt		F	x		
Dr. K. Hermans	Entrepreneur Neodec			x		
Dr. R. l' Abee	Sabic IP			x		
Dr. D. Lippits	Banking			x		
Dr. C. van Oosten	Entrepreneur Peer			x		
Dr. A. Prenen	PTG		F		x	
M. Drieskens, M.Sc.	Univ. Hasselt		F			
M.C. Luengo Gonzalez	<i>discontinuation</i>		F			
Dr. P. Ciselli	Univ. Londen, postdoc		F	x		

## Group Polymer Physics – TN (Thijs Michels)

Post-doctoral fellows	Job2	F/M
Dr. H.P. Huinink	TU/e, TN, ass. prof.	
Dr. K.K. Hannewald	Postdoc Friedrich-Schiller Universität Jena	
Dr. X. Yang	Universiteit China, ful. professor	
Dr. E.D. Sourty	Fei Company	
Dr. J.L.A. Dubbeldam	TU Delft, ass. prof.	
Dr. K.S. Lyakhova	TU/e, ST, ass. prof.	F
Dr. A.V. Kyrylyuk	Postdoc Un. Utrecht, van 't Hoff Lab.	
Dr. M. Bouhassoune	Forschungszentrum Juelich	
Dr. S. Jabbari-Faroudji	Postdoc Université Paris-Sud Centre	F

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. J.A.M. van Gestel	Postdoc TU Delft	Hogeschool		x		
Dr. N.B. Sushko	Postdoc RUG	ING Bank		x		
Dr. S.Y. Trofimov	Tomtom			x		
Dr. W.F. Pasveer	Philips Research			x		
MSc. V.M. Stojanovic	<i>failed</i>			-		
Dr. I. Malakhovsky	ASML				x	
MSc. K.D. Meisel	<i>Deceased 06-08-05</i>			-		
Dr. L.J. Huijbregts	Vision Dynamics		F		x	
Dr. T. Mulder	Océ Technologies BV				x	
Dr. B. Vorselaars	Postdoc Un. Reading UK				x	
MSc. Y.Y. Yimer	<i>failed</i>			-		

**Group Polymer Technology - W (Han Meijer)**

Postdocs	Job2	F/M
Dr.O.S. Galaktionov	NIOO-KNAW	
Dr. C.C. Puig	<i>University S. Bolivar, Caracas, full professor</i>	
Dr. I. Bazhlekoy	Small company	
Dr. E. Sourty	FEI Company Ehv	
Dr. W.R. Hwang	<i>University Korea, full professor</i>	
Dr. J.F. Vega	<i>University of Madrid, ass. prof</i>	
Dr. D. Hristova	<i>TU/e, T, ass. prof.</i>	F
Dr. R. Forstner	TCKT Wels, Austria	
Dr. V. Khatavkar	DSM Research Geleen	
Dr. T.G. Kang	<i>University Korea, full professor</i>	
Dr.S.H.M. Söntjens	Suprapolix	
Dr. J.W. Housmans	Intertek, Polychemlab bv	

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. H.G.H. van Melick	DSM Research Geleen			x		
Dr. Y.W. Stegeman	Philips Research		F	x		
Dr. Barosan	<i>TU/e, ass. prof.</i>				x	
Dr. I.A. van Casteren	NeoResins		F	x		
Dr. R. Rastogi	Philips Lighting		F	x		
Dr. A.N. Zdravkov	TU/e postdoc, T	ASML		x		
Dr. B.A.G. Schrauwen	GEP	DSM Research		x		
Dr. B.J. Kestra	DSM Research Geleen			x		
Ir. A. Sarkissov	<i>failed</i>			-		
Dr. V. Khatavkar	TU/e postdoc, W	DSM Research		x		
Dr. E.T.J. Klompen	Moldflow			x		
Dr. M.H.E. v.d. Beek	TNO	Philips Research			x	
Dr. R.P.M. Janssen	Oce Technologies BV				x	
Dr. R.P. Schaake	SKF				x	
Dr. C. Pelletier	Corus Steel				x	
Dr. J.T.A. Kierkels	Anteryon				x	
Dr. J.W. Housmans	TU/e, postdoc, W	Intertek			x	
Dr. C. Tufano	Sabic		F	x		
Dr. K. Singh	Corus Steel			x		
Dr. P.J.A. Janssen	University of Wisconsin, postdoc			x		
Dr. L.C.A. van Breemen	<i>TU/e, ass. prof.</i>				x	
Dr. T.A.P. Engels	DSM Research Geleen			x		
Dr. F.C. Custodio	small company				x	
Dr. P.K. Kennedy (ext.)	Moldflow, Melbourne			x		
Dr. O. Zavinska (ext.)	DOW Swiss			x		



## Group Soft Tissue Biomechanics & Tissue Engineering – BMT (Frank Baaijens)

Post-doctoral fellows	Job2	F/M
Dr. A. Grillet	Sandia Nat. Lab	F
Dr. C. Vaz	DSM Research geleen	F
Dr. R.P. Hesselink	Pharmacell	
Dr. G.E. Chao	TOTAL UK	
Dr.ir. B.C.G. Faber	Philips Research	F
Dr.ir. A. Stekelenburg	STW	F
Dr. A. Mol	TU/e, <i>ass. prof.</i>	F
Dr.ir. M. Stekelenburg	Leadpharma	F
Dr.ir. N.J.B. Driessen	Recherche	
Dr.ir. D. Gawlitta	UMCN, postdoc	F

PhD students	Job1	Job2	F/M	Duration PhD #years		
				4	<5	>5
Dr. J. de Hart	Hemolab			x		
Dr. M. Maenhout	UM, <i>ass. prof.</i>		F	x		
Dr. A.C.B. Bogaerds	DSM Research Geleen	TU/e, <i>ass. prof.</i>		x		
Dr. H. van Dommelen	USA postdoc	TU/e, <i>ass. prof.</i>		x		
Dr. R.G.M. Breuls	VUmc	Own company			x	
Dr. E.A.G. Peeters	ASML			x		
Dr. F.M. Hendriks	TNO		F		x	
Dr. A. Mol	TU/e, postdoc, BMT	TU/e, <i>ass. prof.</i>	F	x		
Dr. B.G. Sengers	TU/e, postdoc, BMT	South Hampton		x		
Dr. A. Stekelenburg	TU/e, postdoc, BMT	STW	F	x		
Dr. M.I. v. Lieshout	Philips Research		F	x		
Dr. R. Roos	<i>failed</i>			-		
Dr. M. Stekelenburg	TUE/e, postdoc, BMT	Leadpharma	F	x		
Dr. N.J.B. Driessen	TU/e, postdoc, BMT	Recherche		x		
Dr. R.A. Boerboom	TU/e, postdoc, BMT	TNO ,UMCU			x	
Dr. D. Gawlitta	UMCU, postdoc		F	x		
Dr. A. Balguid	Philips Research		F	x		
Dr. D. Bronnenberg	Philips Research		F	x		
Dr. Y. Schroeder	TU/e, postdoc, BMT		F		x	
Dr. K.K. Ceelen	DSM Research Geleen		F	x		
Dr. R.A.A. Pullens	Hezelburcht			x		
Dr. L.H. Cornelissen	PPD, Ede		F	x		
Dr. M.P. Rubbens	QTIS/e		F	x		
Dr. M.A.J. Cox	QTIS/e			x		
Dr. J. Kortsmid	QTIS/e				x	
Dr. F. Kraaijeveld	Shell		F		x	
Ir. M. Geerligs	Philips		F			
Ir. S.D. Dams	Philips		F			