HAL open science

Interface science in JMS

Olivier B M Hardouin Duparc, Sylvie Lartigue-Korinek

To cite this version:

Olivier B M Hardouin Duparc, Sylvie Lartigue-Korinek. Interface science in JMS. Journal of Materials Science, 2020, 55, pp.16861 - 16863. 10.1007/s10853-020-04947-2 . hal-03002037

HAL Id: hal-03002037

https://hal.science/hal-03002037v1

Submitted on 12 Nov 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Published in Journal of Materials Science, online 23 June 2020 and (2020) 55:16861-16863.
https://doi.org/10.1007/s10853-020-04947-2

The list of articles guest-edited by the Authors in JMS is provided in page 5 of this document.

Editorial

Interface Science in JMS

Olivier Hardouin Duparc[1] · **Sylvie Lartigue-Korinek**[2]

[1] LSI, CEA-DRF-IRAMIS, CNRS, École Polytechnique, Institut Polytechnique de Paris, 91128 Palaiseau, France
olivier.hardouinduparc@polytechnique.edu

[2] Institut de Chimie et des Matériaux Paris-Est, UMR 7182 CNRS-UPEC, 2 rue H. Dunant, 94320 Thiais, France
sylvie.lartigue@icmpe.cnrs.fr

Oh Interfaces
Symmetries and Properties
Be intertwined

Inasmuch as most crystalline solids we use are polycrystalline, the study of grain boundaries in materials is an important field of research in materials science. A more general term than grain boundaries is interfaces as it also includes boundaries between different types of materials, different metals, different ceramics, metals and ceramics etc.

Robert Cahn, the founder of Journal of Materials Science (JMS), has always been committed to the study of grain boundaries and once said that his 1953 work on twinning and deformation in α-uranium was "probably the most fascinating research that I have ever been involved in." (see [1]).

Grain boundaries in synthetic materials are of course conceptually similar to grain boundaries or twins in (natural) minerals first studied by French and German scientists since the eighteenth century even if the two scientific communities rarely met (see [2]).

Many international scientific conferences have been organised in the field of grain boundaries since 1960 in France at Saclay, partly stimulated by the worldwide efforts to build nuclear plants in those decades. Several of these meetings led to marked proceedings books or special issues. These conferences were formalized into a triennal series of conferences bearing the name of IIB (*iib*), Intergranular and Interphase Interfaces in materials, conferences since 1989 in Paris.

A specially dedicated journal, Interface Science, was edited by David Srolovitz from 1993 until 2004. Interface Science edited peer reviewed regular articles submitted by *iib2001* attendees, when previous IIB conference articles had simply appeared in proceedings books.

Table 1. Issues of JMS containing papers from the IIB meetings

IIB2001 was published in Interface Science, 9, 141, 2001, Kluwer Acad. Publ. 2002
IIB2004 vol. 40 Issue 13, June 2005: https://link.springer.com/journal/10853/40/11
IIB2007 vol. 43 Issue 11, June 2008: https://link.springer.com/journal/10853/43/11
IIB2010 vol. 46 Issue 12, June 2011: https://link.springer.com/journal/10853/52/8
IIB2013 vol. 49 Issue 11, June 2014: https://link.springer.com/journal/10853/49/11
IIB2016 vol. 52 Issue 8, April 2017: https://link.springer.com/journal/10853/52/8
IIB2019 vol. 55 Issue 22, August 2020: https://link.springer.com/journal/10853/55/22

Interface Science was then incorporated in JMS. Since 2005, JMS has published collections of archival papers from the *iib* meetings in special issues or sections; all papers undergo a full peer review of course, see Table 1.

With the progress in experimental and computational techniques bringing many new conceptual tools, as well as the advent of new materials with their own grain boundaries or interfaces, a three-year periodicity seemed a good choice to gather for mutual presentations of recent and new results and together discussions that always lead to new collaborations.

The *iib2019* conference took place during the first week of July 2019 in the Latin Quarter in Paris at the École de Chimie ParisTech, a School created by Charles Friedel, the famous chemist who also was a mineralogist and studied the relations between physical properties and twins from the point of view of symmetry. It was organized by the *iib2019* organizing committee members and the international advisory board. Supported by the Société Française de Métallurgie et des Matériaux, it was sponsored by academic as well as industrial organizations that are gratefully acknowledged: École Polytechnique, Eloïse – Electron Optics Instrument Service, FERMI – Fédération pour l'Enseignement et la Recherche sur la Métallurgie en Ile de France, Minos – Materials Innovation for Nuclear Optimized Systems, Nanomegas – Advanced tools for electron diffraction, Nanosaclay – LABEX en nanosciences et nanotechnologies, Société Française des Microscopies – French Microscopy Society.

Thanks to these sponsors, *iib2019* invited eight speakers and offered reduced fees to about thirty students. It gathered about 180 participants from twenty countries, and welcomed 158 contributions (87 oral talks + 71 posters) whose abstracts can be found in the booklet available in the iib2019.org a.k.a. https://iib.event-vert.org/ website.

iib2019 was dedicated to Donald McLean (1915-2017) and Lasar Shvindlerman (1935-2018). McLean published well cited articles in JMS [3,4], while Shvindlerman made 5 important contributions to JMS including [5] and [6]. As previous IIB meetings, *iib2019* gathered researchers from different communities all involved in understanding structure, chemistry and related properties of interfaces. The sessions encompassed grain boundary thermodynamics (atomic and electronic structure, segregation), grain boundary dynamics (diffusion corrosion, wetting, migration, phase transformation), interphase boundaries, mechanical properties, plasticity mechanisms, functional properties and low dimensional systems.

The most recent peer-reviewed articles were published in JMS in 2020. We thank the numerous reviewers as well as the JMS teams who contributed to the process, specially taking into account the difficulties caused by the COVID-19 pandemic.

The next meeting, *iib2022,* will take place in Beijing and will be chaired by Profs. Wenzheng Zhang and Rong Yu.

O. Hardouin Duparc

S. Lartigue-Korinek

.

References

[1] Hardouin Duparc O (2007) Robert W. Cahn 1924-2007. Int J Mater Res 98:651-654. https://doi.org/10.3139/146.070704

[2] Hardouin Duparc O (2011) A review of some elements in the history of grain boundaries, centered on Georges Friedel, the coincident 'site' lattice and the twin index. J Mater Sci 46:4116-4134. https://doi.org/10.1007/s10853-011-5367-1

[3] McLean D (1972) Viscous Flow of Aligned Composites. J Mater Sci 7:98-104. https://doi.org/10.1007/BF00549556

[4] McLean D (1975) Storage and loss moduli in discontinuous composites. J Mater Sci 10:481-492. https://doi.org/10.1007/BF00543693

[5] Shvindlerman L, Gottstein G (2005) Cornerstones of grain structure evolution and stability: Vacancies, boundaries, triple junctions. J Mater Sci 40:819-839. https://doi.org/10.1007/s 10853-005-6498-z

[6] Shvindlerman L, Gottstein G, Ivanov VA, Molodov DA, Kolesnikov D, Lojkowski W (2006) Grain boundary excess free volume—direct thermodynamic measurement. J Mater Sci 41:7725-7729. https://doi.org/10.1007/s10853-006-0563-0

DE CHIMIE
Chimie ParisTe
Ecole Nationale Supérieure
PARIS
PSL

The series of JMS-accepted papers linked to *iib*2019, with Olivier Hardouin Duparc and Sylvie Lartigue-Korinek as Guest Editors, are available via the following links:

https://rdcu.be/b4fk4

https://rdcu.be/b4fk7

https://rdcu.be/b4fk9

https://rdcu.be/b4flc

https://rdcu.be/b4fld

https://rdcu.be/b4flf

https://rdcu.be/b4flg

https://rdcu.be/b4fli

https://rdcu.be/b4flj

https://rdcu.be/b4flk

https://rdcu.be/b4flm

https://rdcu.be/b4flo

https://rdcu.be/b4flp

https://rdcu.be/b4flr

https://rdcu.be/b49xw

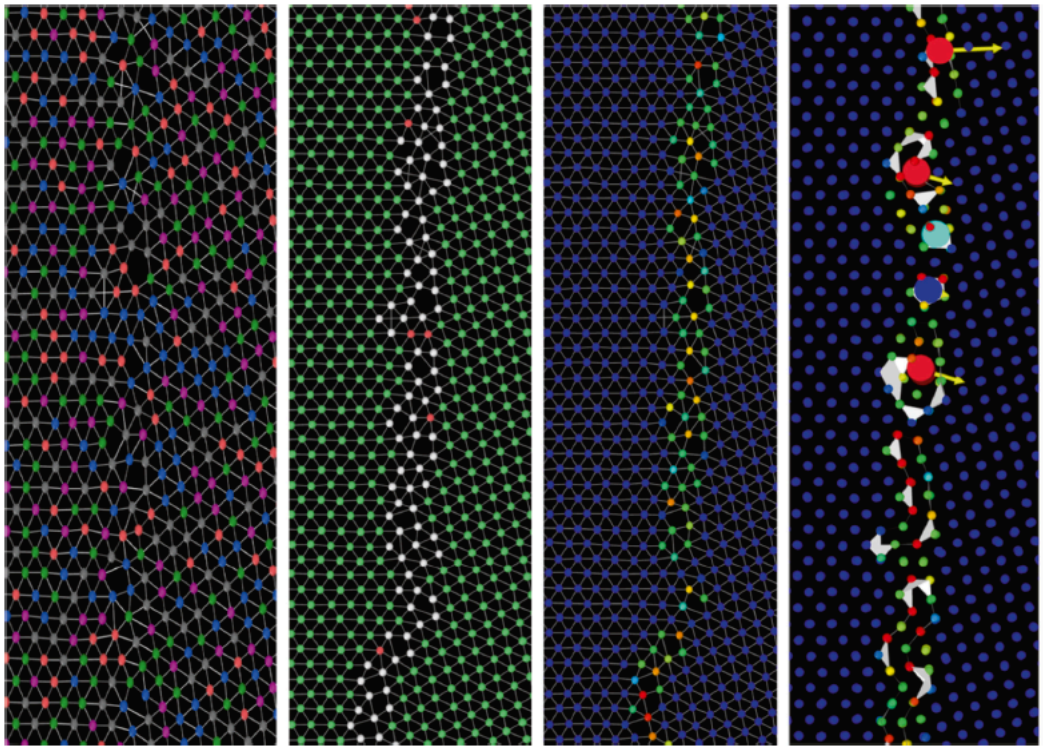
The first fourteen articles have been published in Volume 55 Number 22:

Volume 55 • Number 22
August 2020

Journal of Materials Science

Special Section: Interface Science

Guest Editors: Olivier Hardouin Duparc and Sylvie Lartigue-Korinek



JMS

10853 • 55(22) 9145–9664 (2020)
ISSN 0022-2461 (Print)
ISSN 1573-4803 (Electronic)

Springer