1. International cooperation under the human right to science

Grounds, subjects, objects and contents

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1. INTRODUCTION

The present volume is the first book-length treatment of the international law pertaining to international cooperation in the field of science and, for short, 'international scientific cooperation'.

International scientific cooperation covers a broad range of practices of coordinated transnational action around science.[1] Those practices go by many other names across different regimes of international law, such as 'technology transfers' or 'scientific access and benefit-sharing'. The volume addresses international scientific cooperation from a specific perspective, however:[2] as a

[1] Every time this introduction refers to 'science' in the singular, out of coherence with Article 15(1)(b) ICESCR's language, it should be read to mean 'sciences' in the plural. In short, 'science' is understood here as referring to, on the one hand, any body of knowledge—applied or not—of which there are many diverse forms and, on the other hand, and without being able to separate the process from its outcome, the many social practices by which that body of knowledge is constantly acquired and consolidated over time and space; see for related conceptions drawing from the practice of States, UNESCO, 'Recommendation on Science and Scientific Researchers' (2017) SHS/BIO/PI/2017/3 rev, https://unesdoc.unesco.org/ark:/48223/pf0000263618, last accessed 14 January 2025, paras. 1(a)(i) and (ii); CESCR, 'General Comment No. 25 (2020) on Science and Economic, Social and Cultural Rights (Article 15(1)(b), (2), (3) and (4) ICESCR)' (30 April 2020) UN Doc E/C.12/GC/25, paras. 4 and 5; Alexandra Xanthaki, 'Right to Participate in Science' (21 February 2024) UN Doc A/HRC/55/44, paras. 22 et seq. For a discussion, see also Samantha Besson, 'The Institutional Guarantee of the Human Right to Science' (2025) 25(1) *Human Rights Law Review.*

[2] I first explored this issue in 2015, in Samantha Besson, 'Science without Borders and the Boundaries of Human Rights: Who Owes the Human Right to

duty or, more accurately, a set of duties, and as a duty or set of duties arising from the international 'human right to science' under Article 15(1)(b) and (4) of the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR or Covenant)[3], as this right is usually referred to.[4]

This introduction sets the scene for the volume by explaining the four questions that constitute its red thread and structure: the grounds, the subjects, the objects and the contents of the duty of international cooperation under the human right to science. After a few words of *context* on the human right to science and its contemporary renewed relevance in a globalised world (2), the introduction presents the *stakes* of international scientific cooperation and especially of an international duty thereto (3). It then explores the different *alternative* approaches to that duty currently available to address those stakes in international law (4) and, against this background, identifies the *specificities* of an approach based on the human right to science (5). Focusing on the latter, the next section maps the *gaps* that remain to be filled in the current practice and interpretation of the grounds, subjects, objects and contents of the duty of international scientific cooperation under that right (6). It closes with an *overview* of the different chapters and of how each of them proposes to address those four gaps (7).

2. CONTEXT

This volume situates itself within a recent and growing strand of scholarship that aims at reinvigorating Article 15(1)(b) ICESCR's long-forgotten human right to science in the current context of political and economic globalisation.[5]

Science?' (2015) 4 *European Journal of Human Rights* 462; and then again in 2023, in Katja Achermann/Samantha Besson, 'International Cooperation under the Human Right to Science: What and Whose Duties and Responsibilities?' (2023) 8 *Frontiers in Sociology* 1. The proposed volume may therefore be considered a continuation of that argument and provides a more collective and polyphonic treatment thereof.

[3] *International Covenant on Economic, Social and Cultural Rights* (16 December 1966) 993 UNTS 3 (ICESCR).

[4] The denominations of the right vary, however, and it is also the case between the chapters in this volume. For a discussion of that denomination and for a more participatory one, see Samantha Besson, 'The "Human Right to Science" *qua* Right to Participate in Science: The Participatory Good of Science and its Human Rights Dimensions' (2024) 28(4) *International Journal of Human Rights* 497, 498–499. See also on the latter, CESCR (n 1), para. 11; Xanthaki (n 1), para. 31.

[5] See for the details, Samantha Besson, 'Introduction: Mapping the Issues' (2015) 4 *European Journal of Human Rights* 403; Besson (n 4); Samantha Besson, 'Anticipation under the Human Right to Science: Concepts, Stakes and

The international human right 'to share in scientific advancement and its benefits' was first declared by Article 27(1) of the Universal Declaration of Human Rights (UDHR).[6] This was the first universal declaration of a public, and therefore third-party or heteronomous, guarantee of science as a social institution distinct from the State. Declaring science as an institution of public international law reflected the 1940s' realisation that science should be protected from both the State and the market, on the one hand, and from itself and from the self-validation of science by science, on the other.[7]

Unfortunately, the Cold War rapidly dashed the hopes raised by the human right to science for an international institutionalisation of science that could both guarantee and constrain it at the same time. In the wake of what it did to many other social and cultural rights first declared by the UDHR, indeed, the ICESCR stripped the human right to science of its participatory and collective dimensions. While guaranteeing the human right to science as a binding human right in 1966, Article 15(1)(b) ICESCR also reformulated the right in a purely redistributive and individualist fashion, as the right 'to enjoy the benefits of scientific progress and its applications'.[8] By abandoning the participatory and hence collective dimensions of the right as it was first expressed in Article 27(1) UDHR,[9] Article 15(1)(b) ICESCR introduced two distinctions that had intentionally been left out of the *travaux préparatoires* in 1948: on the one hand, the misleading distinction between the active participation in science (that has actually been guaranteed separately since 1966 as 'scientific freedom' under Article 15(3) ICESCR) and the passive enjoyment of its benefits under Article 15(1)(b) ICESCR and, on the other, the related but equally problematic distinction between scientists as rights-holders of the active right

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Specificities' (2024) 28(3) *International Journal of Human Rights* 293; Besson (n 1).

6 *Universal Declaration of Human Rights* (10 December 1948) UN Doc A/RES/217 A (UDHR).

7 On what I have referred to as the 'international law of science' in general, see Besson (n 1); see also Samantha Besson's 2024 Lecture Series on the topic: https://www.college-de-france.fr/fr/agenda/cours/le-droit-international-de-la-science, last accessed 14 January 2025.

8 Ben Saul/David Kinley/Jacqueline Mowbray, 'Article 15: Cultural Rights' in Ben Saul/David Kinley/Jacqueline Mowbray (eds), *The International Covenant on Economic, Social and Cultural Rights: Commentary, Cases, and Materials* (Oxford University Press 2014), 1175.

9 'Sharing in' in the English version of Article 27(1) UDHR is translated by 'participation' in other languages, such as French, Spanish or Russian, see Mikel Mancisidor, 'The Dawning of a Right: Science and the Universal Declaration of Human Rights (1941–1948)' in Helle Porsdam/Sebastian Porsdam Mann (eds), *The Right to Science: Then and Now* (Cambridge University Press 2021), 17, 24.

to participate in science and other human rights-holders whose sole scientific rights would be the passive right to enjoy the benefits of science.

Deprived of its participatory and collective dimension, the human right to science was put to sleep. Unsurprisingly, it was quickly superseded in practice by other more specialised human rights to whose realisation an equal access to the benefits of science was and still is instrumental, such as the human right to health or to food. No wonder, then, the human right to science rapidly fell into oblivion.

Fortunately, things started to change 15 years ago, thanks among others to efforts to reactivate the right led by different organs and bodies of the United Nations (UN). The most important documents to that effect are, besides the UN General Assembly 1975 Declaration[10] and the UN Educational, Scientific and Cultural Organization's (UNESCO) 1974/2017 Recommendation[11] and its 1999 and 2005 Declarations,[12] the following: UNESCO's 2009 Venice Statement,[13] the UN Special Rapporteur on Cultural Rights' (SRCR) 2012, 2014, 2015 and 2024 reports,[14] and the UN Committee on Economic, Social and Cultural Rights' (CESCR or Committee) 2020 General Comment No. 25.[15]

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[10] UN General Assembly (UNGA), 'Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind' (10 November 1975) A/RES/3384(XXX).

[11] UNESCO (n 1).

[12] UNESCO, 'Declaration on Science and the Use of Scientific Knowledge and the Science Agenda: Framework for Action' (18 August 1999) 30 C/15; UNESCO, 'Universal Declaration on Bioethics and Human Rights' (19 October 2005) SHS/EST/BIO/06/1, SHS.2006/WS/14.

[13] UNESCO, 'Venice Statement on the Rights to Enjoy the Benefits of Scientific Progress and its Applications' (16-17 July 2009), SHS/RSP/HRS-GED/2009/PI/H/1 (Venice Statement).

[14] Farida Shaheed, 'The Right to Enjoy the Benefits of Scientific Progress and its Applications' (14 May 2012) UN Doc A/HRC/20/26; Farida Shaheed, 'Copyright Policy and the Right to Science and Culture' (24 December 2014) UN Doc A/HRC/28/57; Farida Shaheed, 'Patent Policy and the Right to Science and Culture' (4 August 2015) UN Doc A/HRC/70/279; Xanthaki (n 1).

[15] CESCR (n 1). That comment closed the sequel initiated by the publication of two earlier general comments on the other two rights protected by Article 15(1) ICESCR: CESCR, 'General Comment No. 21: Right of Everyone to Take Part in Cultural Life (art. 15(1)(a) ICESCR)' (21 December 2009) UN Doc E/C.12/GC/21; CESCR, 'General Comment No. 17: The Right of Everyone to Benefit from the Protection of the Moral and Material Interests Resulting from any Scientific, Literary or Artistic Production of which He or She is the Author (art. 15(1)(c) ICESCR)' (12 January 2006) UN Doc E/C.12/GC/17.

Thanks to those efforts and the corresponding echoes in scholarship,[16] the human right to science may soon be able to unfold its full potential. The newly proposed interpretations of the human right to science have indeed focused on reviving the right's participatory and collective dimensions in particular. In 2020, the human right to science was actually referred to by the CESCR as the 'human right to participate in science and its benefits'.[17] More specifically, it is now considered to include three main groups of participatory scientific rights: the equal right of everyone to access and participate in scientific practice; the equal right of everyone to access and participate in the benefits of science; and the equal right of everyone to be protected from the negative effects or 'misfits' of science (by contrast to its 'benefits').[18]

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[16] See for example Richard P. Claude, 'Scientists' Rights and the Human Right to the Benefits of Science' in Audrey Chapman/Sage Russell (eds), *Core Obligations: Building A Framework for Economic, Social and Cultural Rights* (Intersentia 2002), 247; Audrey R. Chapman, 'Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications' (2009) 8(1) *Journal of Human Rights* 1; Amrei Müller, 'Remarks on the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and Its Applications (Article 15(1)(b) ICESCR)' (2010) 10(4) *Human Rights Law Review* 765; Eibe Riedel, '"Sleeping Beauty" or Let Sleeping Dogs Lie? The Right of Everyone to Enjoy the Benefits of Scientific Progress and Its Applications (REBSPA)' in Holger P. Hestermeyer et al. (eds), *Coexistence, Cooperation and Solidarity: Liber Amicorum Rüdiger Wolfrum* (Brill/Nijhoff 2012), 503; Sebastian Porsdam Mann/Helle Porsdam/Yvonne Donders, 'Sleeping Beauty: The Right to Science as a Global Ethical Discourse' (2020) 42(2) *Human Rights Quarterly* 332; Mylène Bidault, 'Considering the Right to Enjoy the Benefits of Scientific Progress and Its Applications As a Cultural Right: A Change in Perspective' in Helle Porsdam/Sebastian Porsdam Mann (eds), *The Right to Science: Then and Now* (Cambridge University Press 2021), 140; Andrea Boggio, 'The Right to Participate In and Enjoy the Benefits of Scientific Progress and Its Applications: A Conceptual Map' (2021) 34(2) *New York International Law Review* 43. See also for book-length general treatments of the right: Samantha Besson (ed), 'The Human Right to Science', Special Issue (2015) 4 *European Journal of Human Rights* 403–518; Helle Porsdam/Sebastian Porsdam Mann (eds), *The Right to Science: Then and Now* (Cambridge University Press 2021); Helle Porsdam, *Science as a Cultural Human Right* (University of Pennsylvania Press 2022); Cesare P.R. Romano/Andrea Boggio, *The Human Right to Science: History, Development and Normative Content* (Oxford University Press 2024).

[17] CESCR (n 1), para. 11; Xanthaki (n 1), para. 31. See also, most recently, Interamerican Court of Human Rights (IACtHR), *Climate Emergency and Human Rights* (Advisory Opinion 32, 29 May 2025), para. 471 et seq.

[18] See UNESCO (n 13), para. 13; Besson (n 4).

The reason for this renewed interest in a long-forgotten international human right, especially its participatory and collective dimensions, lies mainly in the contemporary situation of science. In many respects, the latter is reminiscent of that of the 1940s, only much more critical. Indeed, if the difficulties related to the public and private instrumentalisation of science and to the counter-reaction of self-validation by scientists have been cyclical over the centuries, they are now magnified under the pressure of globalisation. As a result, they make the need for an international public law and institution of science even more pressing than before.

First, the global scale of many contemporary scientific practices and of the standard threats weighing on them places those practices beyond the scope of domestic laws and institutions alone. Second, the privatisation of scientific research in a global economy based on innovation overstretches the regulatory capacities of domestic laws and institutions pertaining to (public) science even more. Third, increased economic, military and therefore legal competition between States in a globalised techno-scientific market has led to intense 'forum-shopping' by scientists and scientific investors in search of the most flexible domestic laws regulating scientific research and, in some cases, to the extraterritorial imposition of certain States' domestic law on research conducted in other States which they, for instance, contribute to fund. Fourth, the acceleration of technological developments designed to jugulate the negative effects of earlier technological developments has brought a never-ending loop of scientific research that is difficult to constrain or even to prohibit. Finally, the emergence of dangerous, albeit uncertain, research with the potential to cause serious and irreversible harm to human beings, such as research on bio- and geo-engineering, genome editing and artificial intelligence (AI), defies the probability-based risk management model that has become prevalent and is entrenched in the current domestic and international law of scientific anticipation.

This revived concern for science globally and the renewed relevance of the international human right to science in that context actually echoes growing concerns about globalisation and human rights in general.

In fact, due to the intense privatisation and especially marketisation of science in the current global circumstances, the human right to science situates itself even more clearly than other human rights at the interface between the global economy and human rights. More specifically, the relationship between the human right to science and globalisation matches three well-identified dimensions of that interface. First, like other social and cultural rights, the human right to science has been challenged since its origins by post-war globalisation and even neutralised from the start in its potential for protection. This was especially the case due to the consolidation of the global market and the instrumentalisation of science and innovation therein. Second, however,

the human right to science and the form of 'scientific humanism' it embedded in 1948 are being revived today as a basis for new limits to the instrumentalisation of science in a global innovation-driven economy. Finally, however, and at the same time, unless it is interpreted properly, especially in its participative and collective dimensions, the revival of the human right to science may also be viewed critically by some as yet another individualistic and liberal product of globalisation. The right has indeed already been invoked by some scientists, scientific organisations, scientific investors and even by certain States in order to fuel more science-based globalisation. To that end, it has been interpreted as an individual human right to innovation itself, including at the expense of other human rights.

Those tensions and ambiguities in the relationship between globalisation and human rights and, more specifically, between economic globalisation and the human right to science are clearly illustrated by one of the neglected duties that may be grounded in the human right to science and that is this volume's topic: the duty of international cooperation in the scientific context. The time has come to clarify the stakes of such a duty or set of duties and the potential of the proposed argument in this respect.

3. STAKES

In 1966, States Parties to the ICESCR explicitly recognised the 'benefits to be derived from the encouragement and development of international contacts and co-operation in the scientific [...] field' in Article 15(4) thereof. To that extent, international scientific cooperation may be considered as part and parcel of the long-neglected duties corresponding to the human right to science and that are currently being revived both in practice and in scholarship.

Against the background of the ambivalent relations between science and economic globalisation just mentioned, however, such a human rights-based duty of international scientific cooperation may be considered as a double-edged sword.[19]

On the one hand, indeed, international scientific cooperation corresponds to the universality across time and space that is often regarded as being inherent in the scientific endeavour. It matches the multiple temporal and spatial intersections that are generally considered necessary for developing good scientific practices, from both a philosophy and a history of science perspective.[20]

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[19] See for the details, Besson (n 4); Besson (n 1).

[20] See Sandra Harding, *Is Science Multicultural? Postcolonialisms, Feminisms, and Epistemologies* (Indiana University Press 1998); Michela Massimi, *Perspectival Realism* (Oxford University Press 2022), Ch. 11. See also Lorraine

To that extent, the international scope of a duty of scientific cooperation could be defended in an inherent fashion and for the sake of science itself, independently of economic globalisation. Moreover, once international scientific cooperation is approached as a duty founded in an international human right, it may even contribute to taming the negative consequences of economic globalisation for science. Approaching science as the good or interest protected by a human right, indeed, implies that science should be organised in a way that is characterised by two features: first, it should be sufficiently diverse to be considered truly 'universal', and hence should include all types of scientific knowledge interacting and learning from each other, without however merging them into a single scientific endeavour led by a single scientific community (this is what I have referred to elsewhere as the 'universality in context' of science protected by the human right to science); and, second, it should be sufficiently open to all and in different capacities to be 'egalitarian', and hence should actively compensate for scientific disparities and inequalities between States and secure conditions of international scientific cooperation that are equal, consensual and participative instead of scientific integration and absorption (this is what I have referred to elsewhere as the 'equality in difference' of science protected by the human right to science).

On the other hand, however, unless it is interpreted in the right way, an international human rights-based duty of scientific cooperation could also re-entrench the so-called 'pasteurisation' (by reference to Louis Pasteur's role therein) and uniformisation of science that came with European modernity and hence could constitute a new threat to scientific diversity. In case international scientific cooperation aims at absorbing or integrating knowledge instead of co-producing it on an equal footing, indeed, it could simply worsen scientific inequalities and disparities instead of remedying them.

In turn, such an interpretation could justify forms of appropriation of science both by public institutions (for example, through so-called 'scientific sovereignty' by reference to the human right to self-determination, including an alleged collective right to 'scientific self-determination') and by private persons (for example, through 'intellectual property' (IP) and the alleged human right thereto, a right that has been erroneously grounded in the human right of scientific creators[21]).

Daston, *Rivals: How Scientists Learned to Cooperate* (Columbia Global Reports 2023).

[21] See for a critique of the identification of IP rights with human rights, including with the human right of scientific creators protected under Article 15(1)(c) ICESCR, Aurora Plomer, 'IP Rights and Human Rights: What History Tells Us and Why It Matters' in Helle Porsdam/Sebastian Porsdam Mann (eds), *The Right to Science: Then and Now* (Cambridge University Press 2021), 54. See also

The resilience of this proprietary approach to international scientific cooperation may actually be exemplified by the most recent regime of 'international cooperation' established under Article 8 of the 2023 Agreement on the Conservation and Sustainable Use of Marine Biological Diversity of Areas beyond National Jurisdiction (BBNJ Agreement).[22] That regime of international scientific cooperation indeed co-exists with both scientific sovereignty and IP law regimes. No attempt was made at articulating them to one another or at addressing potential conflicts, despite notable progress regarding the demonetisation of scientific benefits and the common institutionalisation of scientific benefit-sharing in the agreement. Such an IP approach to international scientific cooperation implicating traditional knowledge was actually explicitly endorsed again by the 2024 Agreement on Intellectual Property, Genetic Resources and Associated Traditional Knowledge.[23] The recent 2025 World Health Organization's Agreement on Pandemic Prevention, Preparedness and Response confirms the difficulty of freeing international scientific cooperation from the competing duties arising from IP law.

In short, the human rights-based guarantee of the duty of international scientific cooperation could be considered as yet another handmaiden of globalisation. This should come as no surprise, however. After all, modern European international law *qua* natural law of peoples and modern European science *qua* laws of nature developed hand in hand, and with the same normative and universal project: the development of a unique, a-historical and a-cultural science and that of a unique, a-historical and a-cultural international law. Identifying and specifying a new duty of international scientific cooperation, especially if it is grounded in the international human right to science, may therefore be suspected of aiming to re-entrench, through international law, what has become the indisputable dogma of 'Science' in the singular and with a capital S, and thereby to perpetuate the enterprise of absorbing or, at least, disqualifying local knowledge. It suffices here to think of the repeated economic instrumentalisation of that single modern Science by certain States across time, first for colonial purposes and, more recently, by reference to economic and then sustainable development goals. It is crucial therefore to emancipate international scientific cooperation from its top-down developmental corset and,

CESCR, General Comment No. 17 (n 15); Shaheed, 2012 Report (n 14), para. 65; Shaheed, 2014 Report (n 14); Shaheed, 2015 Report (n 14); Xanthaki (n 1).

[22] *Agreement under the United Nations Convention on the Law of the Sea on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction* (New York, 19 June 2023) (BBNJ Agreement).

[23] *WIPO Treaty on Intellectual Property, Genetic Resources and Associated Traditional Knowledge* (Geneva, 24 May 2024, not yet in force) GRATK/DC/7.

arguably, even from neo-colonial categories, such as those of 'Global North' versus 'Global South' and of 'developed States' versus 'developing States'.

Such are both the promises and the challenges of a human rights-based approach to international cooperation and of the duty of international cooperation grounded in the human right to science. It is the responsibility of scholars and practitioners working with the human right to science to ensure that the duties and responsibilities to cooperate under the human right to science, once rekindled, are interpreted properly and implemented as they should, that is, as duties and responsibilities pertaining to the participatory and collective good of science.

The time has come to turn, first, to the alternative ways of grounding such a duty of international scientific cooperation in international law and then, by comparison and in the next section, to what could be the specific contribution of the human right to science as a new ground for that duty.

4. ALTERNATIVES

Not only are the benefits of international scientific cooperation recognised specifically in Article 15(4) ICESCR, as mentioned earlier, but in its General Comment No. 25 published in 2020, the CESCR has also referred to this provision as establishing a 'reinforced' duty of international cooperation.[24] If this duty arising under the human right to science is considered to be 'reinforced', it is because international scientific cooperation may already be grounded under other international law norms that are not specific to science.

Currently, two groups of duties and responsibilities to cooperate internationally may be identified in international law. Duties and responsibilities of international scientific cooperation may therefore be derived from them. Some arise from general international law or specific regimes of international law other than human rights law, while others are specific to international human rights law.

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[24] CESCR (n 1), para. 77, emphasis added: 'The *duty to cooperate internationally* towards the fulfilment of all economic, social and cultural rights, established in article 2 of the Covenant and in articles 55 and 56 of the Charter of the United Nations, *is reinforced in relation to the right to participate in and to enjoy the benefits of scientific progress and its applications*, as article 15 (4) of the Covenant specifically provides that States parties recognize the benefits to be derived from the encouragement and development of international contacts and cooperation in the scientific and cultural fields. *States need to take steps through legislation and policies, including diplomatic and foreign relations, to promote an enabling global environment for the advancement of science and the enjoyment of the benefits of its applications*'.

On the one hand, three kinds of duties and responsibilities of international scientific cooperation may be founded under either general international law or special regimes of international law.

First, one should mention the general duties of international cooperation arising in general international law.

Those duties have actually long been recognised in general international law, and especially in Articles 1(1)-(3) and 55-56 of the 1945 UN Charter[25] as well as in Article 42 of the 1970 UN Friendly Relations Declaration.[26] Those duties of international cooperation may apply to science as well. Their characteristic, however, is that they are interstate only and hence not owed to individuals or groups. Moreover, they are mostly unidirectional and development-related to the extent that they are considered as being owed by so-called 'developed States' to 'developing States'. For the rest, indeterminacy reigns on the content and scope of those duties, which depend on their specification in different regimes of international law.

Second, and precisely, one should mention the duties of international cooperation specified by each regime of international law, such as international development law, international environmental law, international health law, international biodiversity law, international climate change law, and international law of the sea.

The content and scope of those specific duties of international cooperation are diverse. They indeed depend on the interests or objects protected by the specific duty to cooperate in each regime (for example, resources, education, science or responsibility), on the identity of the subjects and hence duty-bearers in that regime (for example, natural and legal persons, States or international organisations) and on the degree and manner of institutionalisation of the regime in question (for example, administrative or judicial, domestic or international).[27] Some of those specific duties actually pertain to science, as

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[25] *Charter of the United Nations* (San Francisco, 26 June 1945) 1 UNTS 16 (UN Charter).

[26] UNGA, 'Declaration on Principles of International Law concerning Friendly Relations and Cooperation among States in accordance with the Charter of the United Nations' (24 October 1970) UN Doc A/RES/2625 (XXV).

[27] See for example Rüdiger Wolfrum, 'Cooperation, International Law of' (April 2010) *Max Planck Encyclopedia of Public International Law*, https://opil.ouplaw.com/display/10.1093/law:epil/9780199231690/law-9780199231690-e1427?prd=EPIL, last accessed 14 January 2025; Jost Delbrück, 'The International Obligation to Cooperate: An Empty Shell or a Hard Law Principle of International Law? A Critical Look at a Much Debated Paradigm of Modern International Law' in Holger P. Hestermeyer et al. (eds), *Coexistence, Cooperation and Solidarity: Liber Amicorum Rüdiger Wolfrum* (Brill/Nijhoff 2012), 3; Laurence Boisson

illustrated by specific duties of international scientific 'cooperation' and of scientific 'benefit-sharing' among States. This is the case, for example, of Articles 200 to 206 of the United Nations Convention on the Law of the Sea (UNCLOS),[28] Articles 18 and 19 of the Convention on Biological Diversity (CBD),[29] Article 10(2) of the Paris Agreement[30] and Articles 8(3), 14 and 40 to 46 BBNJ Agreement.

Yet again, however, those duties' content and scope are not that determinate yet.[31] Importantly, moreover, those duties are not grounded in the protection of science in itself. On the contrary, they approach science instrumentally only and as a means to protect another good (for example, health, biodiversity, climate change mitigation). In the case of scientific benefit-sharing, moreover, they conceive of scientific benefits in the context of the exploitation of resources (for example, marine genetic resources and their sequencing) and even approach scientific benefits, by extension and based on the same commodifying, proprietary and transactional model, as the benefits of those resources and hence as resources as well. Furthermore, those duties of international scientific cooperation are merely interstate and are not directed or owed to human persons, who may not invoke corresponding rights to cooperation. They are not necessarily owed mutually by all States either, but only by developed States, either bioprospecting or extracting ones, and are generally implemented through bilateral agreements or even private contracts.

Third, one should mention the more specific duty of international cooperation that arises under Article 41 ARSIWA.[32] It is a duty to cooperate in order to bring to an end any serious breach of a peremptory norm of general international law.

This duty of international cooperation may also apply to science depending on the norm of international law that is breached and on how it is breached. Importantly, however, it is interstate only, even if it is an *erga omnes* and

de Chazournes/Jason Rudall, 'Co-operation' in Jorge E. Viñuales (ed), *The UN Friendly Relations Declaration at 50: An Assessment of the Fundamental Principles of International Law* (Cambridge University Press 2020), 105.

28 *United Nations Convention on the Law of the Sea* (Montego Bay, 10 December 1982) 1833 UNTS 3 (UNCLOS).

29 *Convention on Biological Diversity* (Rio de Janeiro, 5 June 1992) 1760 UNTS 79 (CBD).

30 *Paris Agreement* (Paris, 12 December 2015) 3156 UNTS 79.

31 See for example Elisa Morgera, *Fair and Equitable Benefit-Sharing in International Law* (Oxford University Press 2024), 95–133.

32 International Law Commission (ILC), 'Responsibility of States for Internationally Wrongful Acts' (2001) II 20.

omnium duty binding all States towards all other States.[33] Moreover, and for that reason, it only applies to a 'serious breach by a State of an obligation arising under a peremptory norm of general international law' (Article 40(1) ARSIWA). A breach is considered serious 'if it involves a gross or systematic failure by the responsible State to fulfil the obligation' (Article 40(2) ARSIWA).[34] Finally, the duty of international cooperation is reactive only to the extent that it relates to the implementation of another State's responsibility for a serious breach of *jus cogens* that has already occurred.

The peremptory norms that trigger the interstate duty of cooperation under Article 41 of the United Nations' Articles on the Responsibility of States for Internationally Wrongful Acts (ARSIWA) include certain human rights duties, such as the prohibition of torture or of racial discrimination. However, they also include duties that do not arise from international human rights law. In any case, international human rights law includes more specific duties and responsibilities of international cooperation that may also apply to science, to which I will now turn.

On the other hand, indeed, there are three kinds of duties and responsibilities[35] of international scientific cooperation that may be grounded in international human rights law specifically.

First, a general responsibility of international cooperation and/or assistance in the context of the implementation of the Covenant's rights is enshrined in Articles 2(1) and 23 ICESCR.

This responsibility belongs to the general responsibilities of implementation bearing on all States Parties to the Covenant. Its aim indeed is the effective implementation and full realisation of economic, social and cultural rights by their duty-bearers in a world of unequally situated States. To that extent, that responsibility also applies to Article 15(1)(b) ICESCR's human right to science and may actually be said to be partly reiterated by Article 15(2) ICESCR.

The content and scope of Articles 2(1) and 23 ICESCR's responsibilities of international cooperation remain indeterminate. What is clear, however, is that cooperation is conceived as ranging from diplomatic and legal-institutional to economic and technical cooperation, with an emphasis on development

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[33] See for example *Legal Consequences arising from the Policies and Practices of Israel in the Occupied Palestinian Territory, including East Jerusalem* (International Court of Justice, 19 July 2024), Individual Declaration of Judge Tladi, paras. 30–31.

[34] For example, ICJ, *Legal Consequences* (n 33), para. 275.

[35] On the distinction between human rights 'duties' and 'responsibilities' for human rights, see Samantha Besson, 'The Bearers of Human Rights' Duties and Responsibilities for Human Rights: A Quiet (R)Evolution' (2015) 32(1) *Social Philosophy & Policy* 244; Besson (n 2).

assistance and foreign aid. Moreover, the responsibilities are regarded as unidirectional and, more precisely, as only binding the States in a capacity to cooperate.[36] Last but not least, they are interstate responsibilities only to the extent that they are not directed towards human rights-holders nor owed to them.

Second, one should mention the duties of international cooperation that arise under all human rights in the case of concurrent or even shared (territorial and/or extraterritorial) jurisdiction of the duty-bearing States.

When many States have jurisdiction over the same rights-holders, either because some of them exercise effective control outside their territory or because the rights-holders are present, physically or virtually, in different States' territories at the same time, those States all have jurisdiction concurrently and sometimes even share that jurisdiction, be it territorial or extraterritorial, depending on the circumstances. The existence of concurrent or shared jurisdiction then gives rise to concurrent or shared human rights duties. In turn, this explains why the respective States also have a duty to cooperate when specifying and allocating their respective duties in such circumstances, for they all owe them to the same rights-holders.[37] This is the case when either the rights-holders or the duty-bearing States are active transnationally or where the rights-holders are subject to a third-party transnational threat. One may think, for instance, of transnational circumstances, such as war, migration, pollution/emissions, climate change, pandemics and cyber activities.

Those human rights-based duties of international cooperation in case of concurrent or shared jurisdiction qualify all the duties arising under every right and not only the implementation of those duties. To that extent, they are

[36] CESCR, 'General Comment No. 3 on the Nature of States Parties' Obligations (Art. 2, para. 1, of the Covenant)' (14 December 1990) UN Doc E/1991/23, paras. 13–14, emphasis added: 'The Committee wishes to emphasize that in accordance with Articles 55 and 56 of the Charter of the United Nations, with well-established principles of international law, and with the provisions of the Covenant itself, *international cooperation for development and thus for the realization of economic, social and cultural rights is an obligation of all States. It is particularly incumbent upon those States which are in a position to assist others in this regard*'.

[37] Samantha Besson, 'Concurrent Responsibilities under the European Convention on Human Rights: The Concurrence of Human Rights Jurisdictions, Duties, and Responsibilities' in Anne van Aaken/Iulia Motoc (eds), *The European Convention on Human Rights and General International Law* (Oxford University Press 2018), 155; further Samantha Besson, 'Extraterritoriality in International Human Rights Law: Back to the Jurisdictional Drawing Board' in Austen Parrish/Cedric Ryngaert (eds), *Research Handbook on Extraterritoriality in International Law* (Edward Elgar 2023), 269.

owed by the given duty-bearing States to the rights-holders themselves, who have a right to international cooperation between those States. However, like all human rights duties, they are also owed *erga omnes* to all other States at the same time. Moreover, those duties are owed mutually and equally by all States that have concurrent or shared jurisdiction in the specific circumstances, even if the exact allocation of the duties may have to be specified in each case according to equitable criteria, such as capacity, control, causation or need.

Those human rights-based duties of international cooperation in case of concurrent or shared jurisdiction also apply to the human right to science. One may indeed imagine a State's duty to protect the scientific freedom of a rights-holder under its territorial jurisdiction being shared with another State's duty to the same person arising from its funding of that research in the first State. In the case of science, however, it is the third kind of duty of international cooperation, to which I will now turn, that is most relevant.

Finally, indeed, some human rights give rise to duties of international cooperation because either their object or their protected interest or good is inherently transnational. This is the case of the human right to science, but also to health, food, water or religion.

The transnational dimension of the object of certain human rights, indeed, is such that it may not be protected effectively unless all States that owe otherwise separate duties to rights-holders situated under their respective jurisdiction, including under their respective strictly territorial jurisdiction, cooperate with one another. This is because, on the one hand, the good or the interest protected by the right requires the transnational participation of other rights-holders situated under the jurisdiction of other States, thereby triggering duties of cooperation of the respective duty-bearing States to ensure that transnational participation. It may also be because, on the other hand, the threats weighing on that good or interest are transnational, thereby triggering duties of cooperation of the respective duty-bearing States to protect their respective rights-holders against those common threats. Without cooperation with other States, indeed, each respective duty-bearing State could not protect the rights of its respective rights-holders effectively against those threats.

Elsewhere, I have referred to those duties to cooperate as 'collective duties' that are jointly held by their respective duty-bearing States under certain human rights in international human rights law.[38] Those collective duties are complemented by 'collective responsibilities' for the respective human rights by other States that do not have either territorial or extraterritorial jurisdiction over the rights-holders at stake, by international organisations and by private persons and organisations.

[38] See Besson (n 2).

The time has come to turn to the specificities of this third category of duties and responsibilities of international scientific cooperation arising under the human right to science. It is, after all, the only human right whose formal guarantee in international human rights law actually foresees international cooperation explicitly.

5. SPECIFICITIES

The specificities of the duty of international scientific cooperation arising out of the human right to science explain its explicit mention in Article 15(4) ICESCR.

As mentioned before, the Committee emphasises, in its General Comment No. 25, that Article 15(4) ICESCR 'reinforces' the general 'duty to cooperate internationally towards the fulfilment of all economic, social and cultural rights' as established in Article 2(1) ICESCR and Articles 55 and 56 UN Charter.[39] Earlier in the comment, the Committee also insists on States' 'core obligation' to 'foster the development of international contacts and cooperation in the scientific field'.[40]

According to this 'reinforced' duty of international cooperation under the human right to science, says the Committee, States have to promote an 'enabling global environment for the advancement of science and the enjoyment of the benefits of its applications', by taking steps through 'legislation and policies, including diplomatic and foreign relations' in the scientific realm.[41] In the two pages the Committee then devotes to international scientific cooperation in its comment, it discusses four 'justifications' and 'dimensions' of the reinforced duty of international cooperation arising under the human right to science: scientific progress that requires 'universal endeavour'; the deep disparities between 'developing States' and 'developed States' in science and technology that need fixing; the need to share the benefits of scientific progress and its applications with the 'international community'; and the 'transnational' character of the harms and risks of harms associated with scientific progress and applications thereof, and the need to prevent and mitigate them.[42]

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[39] CESCR (n 1), para. 77.

[40] *Ibid*, para. 52. See also for a recent judicial endorsement of this reinforced duty of international scientific cooperation, IACtHR (n 17), para. 475.

[41] *Ibid*, para. 77.

[42] *Ibid*, paras. 78–81, emphasis added: '78. This reinforced duty of international cooperation has several important justifications and dimensions. Firstly, as *certain fields of science necessitate universal endeavour*, international cooperation among scientists should be encouraged in order to foster scientific progress. […]; 79. Second, international cooperation is essential because of the *existence of*

To the extent that it is grounded in the human right to science and hence in the transnational good of science,[43] the duty of international scientific cooperation may be said to be characterised by at least four specificities. Those specific characteristics appear even more clearly when compared with those of other duties of international cooperation arising under general or special international law and even under international human rights law identified in the previous section and that may also apply to science.

First of all, the duty of international scientific cooperation corresponds to a *human right*, and cooperation may therefore be invoked as a right by the respective rights-holders. This gives rights-holders legal standing within international scientific cooperation and therefore a right thereto that can be exercised. To that extent, the duty is not only interstate, even if it is also owed additionally to all other States *qua erga omnes* international human rights-based duty. Besides, other States may, of course, also bear concurrent or shared duties to the same rights-holders—by opposition to their duties of international scientific cooperation arising under their territorial jurisdiction—and the corresponding additional cooperation duties by virtue of their concurrent or shared territorial or extraterritorial jurisdiction. Even in the absence of territorial or extraterritorial jurisdiction and hence of duties to international scientific cooperation, they may also incur responsibilities for the human right to science with the corresponding cooperative dimension.

Second, the duty of international scientific cooperation that arises under Article 15(4) ICESCR is grounded in the *transnational good of science*. To that extent, international scientific cooperation must be organised for the good of science itself rather than approached as an instrument of protection of other interests, such as public health or economic development. This applies even when the latter are protected by other human rights. As argued earlier, it is because science should be transnational and unbounded and because it should

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deep international disparities among countries in science and technology. […]; 80. Third, the *benefits and applications resulting from scientific progress should be shared, with due incentives and regulations, with the international community*, particularly with developing countries, communities living in poverty and groups with special needs and vulnerabilities, especially when the benefits are closely related to the enjoyment of economic, social and cultural rights. […]; 81. Fourth, international cooperation is essential because *the most acute risks to the world related to science and technology*, such as climate change, the rapid loss of biodiversity, the development of dangerous technologies, such as autonomous weapons based on artificial intelligence, or the threat of weapons of mass destruction, especially nuclear weapons, *are transnational* and cannot be adequately addressed without robust international cooperation. […]'.

[43] For details, see Besson (n 2); Besson (n 4); Besson (n 1).

not be limited by national boundaries therefore, while the international legal order and that of human rights duties is inherently bounded by those inter-state boundaries, that the human right to science grounds an additional duty of international scientific cooperation to overcome or compensate for those boundaries.[44]

Third, the duty of international scientific cooperation under the human right to science is held *equally by all States*. To the extent that it is not grounded in specific concurrent or shared territorial and extraterritorial jurisdiction over some rights-holders only, the duty does not bind certain States only, but every State towards all rights-holders under its respective territorial jurisdiction. Nor does it bind some States more than others, unlike duties of international scientific cooperation related to development or technical assistance that are tied to economic or technical capacity. Furthermore, and for the same reason, the duty is also mutual in opposition to unilateral duties of development or technical assistance.

Finally, and in terms of content, the duty of international scientific cooperation is actually not limited to *economic and technical assistance*. It pertains to any dimension of the scientific practice regarding which cooperation is required.

Due to the limited international practice of the human right to science so far, however, the grounds, objects, subjects and contents of the reinforced duty of international scientific cooperation under Article 15(4) ICESCR have remained vague.

Of course, since 2009, various UN bodies interpreting the human right to science have confirmed the benefits of international scientific cooperation.[45] Regrettably, however, beyond emphasising those benefits, recent efforts to interpret the human right to science by various UN bodies have largely failed to fully engage with the duty of international scientific cooperation therein. Despite its lengthy treatment thereof in General Comment No. 25, even the Committee has failed to dispel important indeterminacies regarding that duty, as I will explain in the next section.

Nor have these indeterminacies been addressed by scholars specialising in the human right to science, but for the present volume's editors.[46] There have,

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[44] Besson (n 2).

[45] For pre-2020 discussions of international scientific cooperation, see UNGA (n 10), Articles 1 and 5; UNESCO (n 13), paras. 4, 12(g), 16(a), 16(d), 24, 66–68 and 70–73; Shaheed, 2012 Report (n 14), paras. 8, 66–67 and 75; further, more recently, Xanthaki (n 1), paras. 27–28.

[46] See Besson (n 2); Achermann/Besson (n 2). See, however, most recently, Remmy Shawa, 'Never Walk Alone: Using International Cooperation and the Right to Science to Build Back Better' in Andrea Broderick/Jennifer Sellin

of course, been a couple of references to it in passing,[47] but the proposed volume is the first book-length treatment of the topic.

As a matter of fact, to the extent that the duty of international cooperation under Article 2(1) ICESCR, under the human right to development[48] or

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(eds), *Socio-economic Rights, Inequalities and Vulnerability in Times of Crises: Building Back Better* (Edward Elgar Publishing 2024), 145.

[47] See for example Chapman (n 16), 14, 24–27 and 29–31; Müller (n 16), 779–783; Porsdam (n 16), 99 et seq.; Romano/Boggio (n 16), 707–708.

[48] See for example Philip Alston/Gerard Quinn, 'The Nature and Scope of States Parties' Obligations under the International Covenant on Economic, Social and Cultural Rights' (1987) 9(2) *Human Rights Quarterly* 156; Asbjørn Eide, 'Human Rights Requirements for Social and Economic Development' (1996) 21(1) *Food Policy* 23, 24; Philip Alston, 'Ships Passing in the Night: The Current State of the Human Rights and Development Debate Seen through the Lens of the Millennium Development Goals' (2005) 27(3) *Human Rights Quarterly* 755; Margot E. Salomon, *Global Responsibility for Human Rights: World Poverty and the Development of International Law* (Oxford University Press 2007); Wouter Vandenhole, 'Economic, Social and Cultural Rights in the CRC: Is There a Legal Obligation to Cooperate Internationally for Development?' (2009) 17(1) *The International Journal of Children's Rights* 23; Judith Bueno de Mesquita/Paul Hunt/Rajat Khosla, 'The Human Rights Responsibility of International Assistance and Cooperation in Health' in Mark Gibney/Sigrun I. Skogly (eds), *Universal Human Rights and Extraterritorial Obligations* (University of Pennsylvania Press 2010), 104; Malcolm Langford/Wouter Vandenhole/Martin Scheinin/Willem van Genugten (eds), *Global Justice, State Duties: The Extraterritorial Scope of Economic, Social, and Cultural Rights in International Law* (Cambridge University Press 2012); Margot E. Salomon, 'Deprivation, Causation and the Law of International Cooperation' in Malcolm Langford et al. (eds), *Global Justice, State Duties: The Extraterritorial Scope of Economic, Social and Cultural Rights in International Law* (Cambridge University Press 2012), 259; Oliver De Schutter/Asbjørn Eide/Ashfaq Khalfan/Marcos Orellana/Margot Salomon/Ian Seiderman, 'Commentary to the Maastricht Principles on Extraterritorial Obligations of States in the Area of Economic, Social and Cultural Rights' (2012) 34(4) *Human Rights Quarterly* 1084; Saul/Kinley/Mowbray (n 8), 139–40; Ralph Wilde, 'Socioeconomic Rights, Extraterritorially' in Eyal Benvenisti/Georg Nolte (eds), *Community Interests Across International Law* (Oxford University Press 2018), 381; Olivier De Schutter, 'A Duty to Negotiate in Good Faith as Part of the Duty to Cooperate to Establish "An International Legal Order in which Human Rights can be Fully Realized": The New Frontier of the Right to Development' in Nehal Bhuta/Florian Hoffmann/Sarah Knuckey/Frédéric Mégret/Margaret Satterthwaite (eds), *The Struggle for Human Rights: Essays in Honour of Philip Alston* (Oxford University Press 2021), 140; Wouter Vandenhole, 'Development Cooperation' in Christina Binder/Manfred Nowak/Jane A. Hofbauer/Philipp Janig (eds), *Elgar Encyclopedia of Human Rights* (Edward Elgar Publishing 2022), 1.

in international human rights law in general[49] has not received much more scholarly attention either, the proposed volume is a contribution to the latter debates as well. Indeed, most discussions by international human rights law scholars to date have not been specific to international cooperation and, even then, have only addressed it in passing and mostly with respect to economic, social and cultural rights. When they have dealt with it at length, they have mainly focused on two issues, that is, the legal bindingness of the duty and its territorial or extraterritorial jurisdictional scope, at the expense of others.

A further specific contribution of the volume pertains to the human rights gap in the literature related to duties of international scientific cooperation arising from other regimes of international law. As mentioned before, some of those specific regimes of international law, such as international climate change law, international biodiversity law, international law of the sea or international health law, do indeed foresee specific interstate duties of international scientific 'cooperation', scientific 'benefit-sharing' and 'technology transfers' among States. While some authors have started interpreting those duties in conformity with the human right to science's duty of international cooperation,[50] those attempts are still scarce. Most of them, moreover, are

[49] See for example Sigrun I. Skogly, *Beyond National Borders: States' Human Rights Obligations in International Cooperation* (Intersentia 2006); Benoit Mayer, 'Climate Change Mitigation as an Obligation under Human Rights Treaties?' (2021) 115(3) *American Journal of International Law* 409; Stephanie Schiedermair, 'International Cooperation' in Christina Binder/Manfred Nowak/Jane A. Hofbauer/Philipp Janig (eds), *Elgar Encyclopedia of Human Rights* (Edward Elgar Publishing 2022), 163; Vincent Bellinkx/Deborah Casalin/Gamze Erdem Türkelli/Werner Scholtz/Wouter Vandenhole, 'Addressing Climate Change through International Human Rights Law: From (Extra)Territoriality to Common Concern of Humankind' (2022) 11(1) *Transnational Environmental Law* 69; Katja Achermann, 'Human Rights Obligations to Cooperate Internationally' in Frédéric Bouhon et al. (eds), *Les droits humains en temps de pandémie. Perspectives internationales, européennes et comparées* (Larcier 2023), 103; Katja Achermann, *Cooperative Human Rights Obligations: Cooperative Human Rights Obligations: Operationalising Cooperation for the Effective Protection of Civil and Political Rights in Transnational Constellations* (Thesis, University of Cambridge, 2023); Antal Berkes, 'The Obligation to Cooperate to Protect Against Serious Breaches of the European and American Conventions on Human Rights', (2024) 26(6) *International Community Law Review* 550; Prisca Feihle, *An International Human Rights Law of Cooperation: International Cooperation, State Responsibility and the European Convention on Human Rights* (Edward Elgar 2025).

[50] See for example Kim Bouwer, 'Insights for Climate Technology Transfer from International Environmental and Human Rights Law' (2018) 23 *Journal of Intellectual Property Rights* 7; Anna-Maria Hubert, 'The Human Right to

not very specific about the conditions of such 'systemic integration' of the respective duties and of the direction that integration should take. More should be done, indeed, to overcome the largely instrumental and even proprietary approach to scientific cooperation and benefit-sharing at play in most of those regimes—not to mention the inequalities and hierarchies that characterise the institutions and processes some of the corresponding treaties have set up for international scientific cooperation so far.

6. GAPS

As mentioned earlier, the grounds, objects, subjects and contents of the reinforced duty of international scientific cooperation under Article 15(4) ICESCR remain largely indeterminate. In fact, not only has the CESCR not addressed most of those indeterminacies, but it may also be said to have contributed to magnifying some of them.

These indeterminacies, first, concern the *nature* and the *grounds* of the respective 'duties' and/or 'responsibilities' to cooperate internationally and their relations to the other duties arising under the human right to science.

The Committee rightly asserts that Article 15(4) ICESCR, in the wake of Article 2(1) ICESCR and Articles 55 and 56 UN Charter, establishes a 'duty' of international scientific cooperation and even a 'core obligation' thereto. In light of the controversy that has long surrounded the bindingness of international cooperation in all those provisions,[51] the Committee should be commended for this welcome clarification of the legally binding nature of international scientific cooperation under the human right to science.

One may still regret, however, that the Committee consistently uses the word 'should' instead of 'shall' thereafter in relation to the measures to be adopted by States to comply with this duty.[52] The CESCR's language only changes in relation to States' 'extraterritorial obligations'.[53] The Committee thereby adds to the confusion surrounding the alleged necessarily 'extraterritorial' scope

Science and its Relationship to International Environmental Law' (2020) 31(2) *European Journal of International Law* 625, 638–639; Abbie-Rose Hampton/Mark Eccleston-Turner/Michelle Rourke/Stephanie Switzer, '"Equity" in the Pandemic Treaty: The False Hope of "Access and Benefit-Sharing"' (2023) 72(4) *International & Comparative Law Quarterly* 909, 939; Morgera (n 31).

[51] See for example Alston/Quinn (n 48), 186 and 191; Saul/Kinley/Mowbray (n 8), 139–140; Schiedermair (n 49).

[52] CESCR (n 1), paras. 78–84.

[53] *Ibid*, paras. 83 and 84.

of the duty of international cooperation.[54] Indeed, as argued earlier, a duty of international scientific cooperation could arise, due to the transnational scope of the scientific practice, from both the territorial and the extraterritorial control exercised by the duty-bearing State over different rights-holders.[55] To that extent, it may be said to apply both inside a given State's territorial jurisdiction towards people situated within its territory and outside thereof when that State is considered to have extraterritorial jurisdiction over other people situated outside its territory.[56]

The same may be said about the neglect by the Committee of the 'responsibilities' for international scientific cooperation of other States than the State of jurisdiction, of international organisations and of private persons and organisations. Because they are not directed and owed to specific rights-holders, those responsibilities do not depend on jurisdiction over them, whether territorial or extraterritorial, but, at the most, on control over the source of harm. This is also, as explained earlier, how other States' responsibilities under Article 2(1) ICESCR have been understood so far, without a reference to extraterritorial jurisdiction.

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[54] See on this long-lasting confusion, Samantha Besson, 'The Extraterritoriality of the European Convention on Human Rights: Why Human Rights Depend on Jurisdiction and What Jurisdiction Amounts to' (2012) 25(4) *Leiden Journal of International Law* 857; Besson, 'Extraterritoriality in International Human Rights Law' (n 37).

[55] Besson (n 2); Achermann/Besson (n 2).

[56] Not to mention the misleading examples used by the CESCR in paras. 83 and 84 that are either cases of duties of international cooperation that do not arise from extraterritorial jurisdiction (for example, the duties to cooperate when concluding multilateral IP agreements pertaining to scientific applications) or cases of duties that are neither cooperative nor extraterritorial (for example, the due diligence duties of Member States not to use their international organisations to circumvent their human rights duties). The example of the extraterritorial duty to regulate and monitor multinational companies is the most misleading of all to the extent that it falls prey to another conflation: that between due diligence duties of States to prevent harm caused abroad by people they have control over (for example, multinational corporations) independently of any extraterritorial control and hence jurisdiction over the human rights-holders themselves, on the one hand, and those States' additional extraterritorial human rights duties owed to the latter only in the case of extraterritorial jurisdiction or effective control over them, or, at least, their due diligence responsibilities for their human rights, on the other. On that distinction, see Samantha Besson, 'Due Diligence and Extraterritorial Human Rights Obligations – Mind the Gap!' (2020) 9(1) *European Society of International Law Reflections*, https://esil-sedi.eu/wp-content/uploads/2020/04/ESIL-Reflection-Besson-S.-3.pdf, last accessed 14 January 2025.

What this means then is that the grounds of the duty of international scientific cooperation should be found otherwise. Regrettably, however, except for a reference to scientific progress in certain fields requiring a 'universal endeavour', the Committee remains evasive as to the actual grounds for the binding nature of the duty of international cooperation under the human right to science. As I have argued elsewhere and mentioned in the previous section, the duty's binding nature may be grounded in the transnational good of science and the corresponding 'collective' dimension of the duties correlative to the human right to science that are held jointly by all States.[57] The collective dimension of those duties implies a duty to cooperate in order to specify the content of States' duties, allocate them and implement them together.

As mentioned earlier, the justification for the collective and, by extension, cooperative dimension of those duties is twofold. First, as a right pertaining to a transnational good and practice, the human right to science can only be effectively protected if all duty-bearing States cooperate to specify, allocate and implement jointly the duties they owe separately to the persons under their respective—territorial, but also, albeit more rarely, extraterritorial—jurisdiction. The holders of the human right to science, indeed, should be able to interact and cooperate in transnational scientific practices, to access and benefit from scientific research conducted anywhere else, and be protected against dangerous scientific research being pursued anywhere else. Second, the collective nature of those duties is also a condition for the feasibility of the protection of science against its standard threats. Indeed, as argued earlier, most of those threats, both public and private in origin, are transnational today and can only be anticipated, mitigated or set aside through international cooperation. This argument also applies, by extension, to the justification of the responsibilities to cooperate arising from the human right to science.

A second indeterminacy in the interpretation of the duty of international cooperation in General Comment No. 25 pertains to the *objects* of the respective 'duties' and/or 'responsibilities' of cooperation under the human right to science.

Interestingly, the Committee lists and develops four 'dimensions' of the duty of international cooperation that give some idea of what its objects could be.[58] As mentioned earlier, the fact that the Committee also refers to them as 'justifications' is, however, a clear indication of the need to ground those dimensions normatively as specific duties under the human right to science. In turn, this requires linking those duties of international scientific cooperation's object more closely to the object of the human right to science and the three

[57] Besson (n 2); Besson (n 4).
[58] CESCR (n 1), paras. 78–84.

specific scientific interests protected: access and participation in the scientific practice; access and participation in the benefits of science; and protection from the negative effects or 'misfits' of science. What this implies more specifically regarding the object of the duty of international scientific cooperation is that it should be regarded as tri-dimensional and the duty as: first, a duty to cooperate to secure access and participation in the scientific practice; second, a duty to cooperate to secure access and participation in the benefits of science; and, third, a duty to cooperate to ensure protection from the misfits of science.

Accordingly, all duties arising under the three scientific rights corresponding to the human right to science and all objects protected by those rights should be considered as also having a cooperative dimension, including an international cooperative dimension. International scientific cooperation should therefore not be reduced to a matter of access to science and its benefits, and hence to the international 'sharing of scientific benefits' and to 'technology transfers'. This interpretation is actually confirmed by the fact that some of the four dimensions of the duty of international scientific cooperation identified by the Committee in its comment overlap. This is the case of access to and sharing of scientific benefits under the second and third dimensions of cooperation in the comment.

All this reveals a third indeterminacy pertaining to *subjects*, which concerns the identity of the bearers of 'reinforced duties of international cooperation' and 'responsibilities' and the identity of their beneficiaries. Who should cooperate with whom (i.e. its *duty-bearers*)? And to whom is this cooperation as a duty actually owed (i.e. its *rights-holders*)?

Regarding the duty-bearers, on the one hand, the CESCR fails to systematically engage with the identity of the different public institutions (for example, States, but also some international organisations) bearing a duty of international scientific cooperation. Nor does it address the issue of allocation of the respective duties of cooperation between them, be it in terms of its institutionalisation or in terms of equitable criteria for the specification of those duties as 'common but differentiated duties', such as capacity, control, needs, resources, proximity or causation.[59] The Committee rather crudely distinguishes between 'developing' and 'developed' States,[60] as if the duty of international cooperation under the human right to science was not owed by all States, as if the sole allocation criterion was development, and as if the duty was not mutual, but unilateral, bearing more heavily or solely on either developed or developing

[59] Besson (n 37); Samantha Besson, 'The Allocation of Anti-poverty Rights Duties – Our Rights, but Whose Duties?' in Krista Nadakavukaren Schefer (ed), *Poverty and the International Economic Legal System. Duties to the World's Poor* (Cambridge University Press 2013), 408.

[60] CESCR (n 1), para. 79.

States. Finally, the issue of conflicts between the duty of international scientific cooperation and other duties of States arising under the human right to science, under other human rights or even under other international law norms is barely touched upon. As mentioned earlier, this is the case of potential conflicts with international IP law, of course, but one may also think of conflicts with the concurrent right to scientific sovereignty and self-determination of States and peoples, on the one hand, and of the concurrent human right of scientific creators under Article 15(1)(c) ICESCR, on the other.

Furthermore, the Committee fails to address the complementary 'responsibilities' to cooperate of other States than the States of territorial or extraterritorial jurisdiction, but also of international organisations and of private persons and organisations. This is regrettable knowing that the latter are carrying out a significant proportion of what passes for scientific research today. It is important to remember that their responsibilities to cooperate for the human right to science are not oriented, that is, owed to a human rights-holder in particular, but owed at the most to other States as *erga omnes partes* responsibilities. Even if they do not depend on territorial or extraterritorial jurisdiction over the rights-holder, those responsibilities are collective. To that extent, they still need to be allocated to avoid the 'too many hands problem'.[61]

The Committee also fails, on the other hand, to clarify the position of human persons and their scientific communities, including indigenous peoples, as actual holders of the human right to science. It does not explore the personal scope of the human right corresponding to the duty of international cooperation in scientific matters. To that extent, it perpetuates the purely interstate approach identified earlier to the duties of international scientific cooperation under general and special international law and to the responsibilities of international cooperation under Article 2(1) ICESCR. In turn, what this means, of course, is that potential conflicts between—individual, whether personal or collective, and group[62]—rights to international scientific cooperation, both between themselves and with other scientific rights arising under the human right to science (for example, anti-discrimination rights or scientific creators' rights under Article 15(1)(c) ICESCR) are not considered.

Furthermore, and this is related, the distinction between rights-holders and other mere 'beneficiaries' of international scientific cooperation, such as indigenous peoples and scientific communities themselves in case such groups are not regarded as rights-holders, has not been explored sufficiently by the Committee. Nor does the Committee distinguish sufficiently between the

[61] Besson, 'Concurrent Responsibilities' (n 37); Besson (n 59).

[62] For an argument for both a group and an individual (collective and personal) human right to science, see Besson (n 1).

public duty-bearers and, by extension, the public and private responsibility-bearers of international scientific cooperation under the human right to science, first, and the actual persons and communities, such as indigenous peoples or local scientific communities, that could be involved in that cooperation by the domestic law that States shall adopt for the implementation of the right, second. After all, indeed, and as explained earlier, science being a participatory good, its protection calls for participation and hence for scientific cooperation *stricto sensu* among all participants in the scientific practice itself. This is confirmed, for instance, by Articles 8(3), 14 and 40 to 46 BBNJ Agreement. True, those participants also have a right not to participate in international scientific cooperation under the human right to science and, to that extent, not to cooperate. The question, however, is how to reconcile that right not only with the 'communal responsibilities' of scientists and scientific communities arising from the communal good of science in scientific ethics or self-regulation,[63] but also with their international legal responsibilities for the human right to international scientific cooperation discussed earlier.

A fourth indeterminacy pertains to the specific *content* of the 'reinforced duty of international cooperation'.[64] Like other duties arising under a human right, it may be said to encompass negative as much as positive duties. It could pertain to duties to cooperate in order to respect, protect and fulfil, and, over time, to cooperate with respect to duties to prevent and remedy as much as to protect.

For the rest, General Comment No. 25 tautologically refers to the need for States Parties to 'resort to international assistance and cooperation' in order to comply with their reinforced duty of international cooperation.[65] It remains unclear, however, what a duty to 'resort to international assistance and cooperation' actually requires States to do and what it may amount to, especially if and how international scientific cooperation should be distinguished from non-scientific 'economic' and 'technical' assistance and development aid under Article 2(1) ICESCR. One may imagine, for instance, adopting international treaties and resolutions, co-producing knowledge, securing open access to publications and databases, etc.

In this respect, it is important to pay particular attention to the careful selection of the means of international scientific cooperation. Indeed, the mechanisms currently in place in other international law regimes that foresee international scientific cooperation may not be compatible with the human right to science. One may think here of the use of contractual mechanisms, IP

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[63] *Ibid*.

[64] CESCR (n 1), para. 78.

[65] *Ibid*, para. 79. For a more detailed account of what the 'co-production' of knowledge could amount to, see IACtHR (n 17), para. 480.

rights and, more generally, the commodification and monetisation of scientific data in benefit-sharing schemes under the CBD or the BBNJ Agreement, as mentioned earlier. In this context, it is important to clarify issues of systemic integration, and of its direction, with interstate duties and institutions of scientific cooperation and scientific benefit-sharing under other regimes of international law, especially when the latter approach science in an instrumental manner.

Last but not least, the Committee fails to elaborate on the duty to 'establish institutions to promote the development and diffusion of science and technology', which was identified by the 2009 Venice Statement as a core duty to fulfil the human right to science.[66] It merely emphasises that States have to promote an 'enabling global environment' for international scientific cooperation, including by taking steps through 'legislation and policies, including diplomatic and foreign relations'.[67] It does not therefore specify the international institutional frameworks that shall be established in order to effectively realise international cooperation in the scientific realm and especially allocate various concurrent duties of cooperation and responsibilities. It is clear, however, that such frameworks should be developed cooperatively and hand-in-hand with scientific communities in order to comply with those communities' right to self-regulation and self-government.[68]

7. OVERVIEW

Mirroring the four sets of indeterminacies and gaps identified in the current interpretations of the duty of international scientific cooperation under the human right to science, the present volume is organised in four parts: the grounds, the subjects, the objects and the contents of international scientific cooperation. Each part includes two to three chapters.

There is, of course, a certain degree of overlap between the different chapters. This is inevitable in light, on the one hand, of the complexity of the topic of international scientific cooperation. This is especially the case in the volume's later chapters on the objects and contents of the duty of international scientific cooperation, as they have to rely on a given conception of its grounds and subjects. One should also bear in mind, on the other hand, authors' differences in theoretical or ideological takes on each of those questions. Some chapters have therefore made a point of differentiating themselves from others on cross-cutting issues. This is the case, for instance, on the exact linkages

66 UNESCO, Venice Statement 2009 (n 13), paras. 4 and 16(a) and (d).
67 CESCR (n 1), para. 77.
68 Besson (n 2); Besson (n 1).

between the duty of international scientific cooperation and extraterritorial jurisdiction, on the justification and scope of systemic integration between the duty of international scientific cooperation under the human right to science and the corresponding duty under other regimes of international law or, finally, on the international scientific cooperation duties and/or responsibilities of private persons and organisations.

Part I *The Grounds for International Scientific Cooperation* entails two chapters that pertain to the potential grounds of the duty of international scientific cooperation in international human rights law and across other international law regimes. While the first chapter develops an argument in favour of grounding the duty of international scientific cooperation in the extraterritorial jurisdiction of States and discusses some of its limits, the second one broaches the question of systemic integration between the duty of international scientific cooperation arising under the human right to science and the BBNJ Agreement and argues for the former's priority in that integration.

In his chapter 'In Search of the Legal Dimensions of "Global Science Inclusiveness": Empowering the Global South', Klaus D. Beiter starts by observing that 'internationality' underlies the normative structure of science. While Article 15(1)(b) ICESCR recognises everyone's right 'to enjoy the benefits of scientific progress and its applications', Article 15(4)—calling on States Parties to encourage and develop international contacts and cooperation in the scientific field—builds 'internationality' into the very structure of Article 15, lending support to viewing 'global science inclusiveness' as a legal construct under the Covenant. 'Global science inclusiveness' signifies that no country or region, also not the Global South and its scientists and citizens, may be excluded from scientific endeavour, the sharing of benefits, and science governance as a concerted universal enterprise. Based on Article 15(4) ICESCR and other normative elements within and outside the ICESCR, the chapter seeks to rudimentarily construct the legal dimensions of 'global science inclusiveness' by a reliance on extraterritorial State obligations under the right to science in Article 15(1)(b) ICESCR and group rights to self-determination, development and international solidarity.

Anna-Maria Hubert's chapter, 'Who is Science for? The Dimensions of the Duty of International Cooperation under the Human Right to Science and the Relationship with International Environmental Law', explores the intersections between the duty to cooperate under the human right to science and related duties in international environmental law. It examines the nature, scope and content of this reinforced duty of international cooperation under the human right to science in Article 15(4) ICESCR. The contribution then goes on to compare related obligations of international cooperation in science and technology under the BBNJ Agreement. The analysis highlights areas of alignment and divergence between these two regimes, offering insights into

systemic integration and potential reforms. It argues for prioritising the human right to science as a guiding framework for international cooperation, given its emphasis on science as a public good and its broader human rights implications. It concludes by emphasising the need for further scholarship to refine the scope and implementation of cooperative duties, particularly in light of growing global challenges and disparities in scientific access and benefits.

Part II *The Subjects for International Scientific Cooperation* encompasses two chapters that broaden the scope of both the rights-holders and duty-bearers of the duties and responsibilities of international scientific cooperation under the human right to science to indigenous peoples and other epistemic communities. While the first chapter focuses on the rights-holders and duty-bearers of international scientific cooperation when its object is access to and participation in indigenous knowledge, the second one shifts its focus away from interstate scientific cooperation by turning to epistemic cooperation across and between different epistemic communities and explains how such epistemic cooperation may fit into the duty of international scientific cooperation under the human right to science.

In her chapter 'Indigenous Peoples' Knowledge: A Forgotten Piece in International Cooperation under the Human Right to Science?', Camila Perruso explores the role of indigenous knowledge in the context of international cooperation and the human right to science. Indigenous knowledge, which is distinct from—but often confused with—traditional knowledge, serves as an essential resource for biodiversity conservation, cultural practices and sustainable development. The chapter identifies several challenges which relate to and/or require international cooperation, including biopiracy, intellectual property laws and the limited recognition of indigenous contributions within the scientific discourse. The author emphasises the importance of developing institutional and normative frameworks that protect indigenous peoples' rights and knowledge, particularly by ensuring their participation in scientific endeavours. Advocating for epistemic pluralism and the co-creation of knowledge, she argues for transformative international cooperation that appreciates indigenous knowledge alongside Western science. This would contribute to bridging global inequities, enhance scientific efforts and promote sustainable solutions to environmental and cultural issues, while ensuring the active involvement of indigenous peoples in scientific and policy-making processes.

In her chapter 'The Right to Participate in Science: Navigating Cooperation Across Epistemic Jurisdictions', Michela Massimi takes steps in defining the notion of 'epistemic cooperation'. By contrast with institutional and legal cooperation, Massimi understands 'epistemic cooperation' primarily as cooperation among 'epistemic jurisdictions'. The latter are understood as jurisdictions concerning the allocation of knowledge and expertise (i.e. who the experts are in a given scientific domain of inquiry). Massimi elucidates a received view

of epistemic jurisdiction that she calls the territory-centred view and shows its shortcomings when it comes to understanding the value and significance of cooperation among different ways of knowing. Massimi proposes an alternative view—the community-based view. Instead of allocating expertise and knowledge to silos, the community-based view focuses on the situated knowledge of epistemic communities. It highlights the reciprocal and relational—rather than mutually exclusive—interactions among ways of knowing, which are key to the implementation of the human right to participate in science and to the collective pursuit of goals of justice.

Part III *The Objects of International Scientific Cooperation* entails two chapters that pertain to the scope of the duty of international scientific cooperation under the human right to science, depending on which of the three specific scientific rights protected by the right is at stake. While the first chapter explores what international scientific cooperation relating to the duty to protect against the harms of privatised science could imply, the second one focuses on international scientific cooperation in the context of the duty to protect against two specific cases of dangerous science: bioprospecting and AI.

In her chapter 'Cooperation for the Human Right to Be Protected Against the Harms to/of Science: States' Duties and Non-State Public Scientific Institutions' Responsibilities', Amrei Müller observes that today's global scientific enterprise is largely privatised and employs science to achieve various economic, financial, power-political, social and other aims. This leads to a situation in which the specific kind of science as a public, participatory, results-open and continuous practice, participation in which is protected both as an individual human right and arguably as a group right by Article 15(1)(c), (3) and (4) ICESCR has become a rare occurrence; and to a situation where such global scientific enterprise produces harms, including severe and even irreversible or existential harms. Against this background, the chapter examines States' duties and non-state public scientific institutions' (supporting) responsibilities to identify and to diligently address the harms of science corresponding to the human and group rights to participate in science and to be protected against its harms. Given that many harms are transnational or global, domestic and international cooperative dimensions of these duties and responsibilities are at the centre of the analysis.

In their chapter 'International Cooperation under the Human Right to Science in Light of New Developments in International Law and New and Emerging Technologies: Human Rights-Based Technology Transfer in the Field of Bioprospecting and AI?', Silja Voeneky and Gizem Demir seek to elucidate the scope of the duties and obligations to cooperate internationally under the human right to science, as articulated in Article 15 ICESCR. They focus on two critical domains for innovation and disruptive technologies: the protection of genetic resources in the high seas and the use of AI and the

development of AI-driven technologies. The first two sections explore the content of core notions of the right to science and its links to the duty to cooperate, including the transfer of technologies. The subsequent section examines whether the obligations relating to technology transfer in the BBNJ Agreement can inform the interpretation of obligations arising under the right to science. The final section analyses whether the right to science imposes obligations concerning AI—an urgent and timely issue given the absence of universal international treaties regulating AI.

Part IV *The Content of International Scientific Cooperation* entails three chapters pertaining to the types of duties and responsibilities to respect, protect and fulfil that entail international scientific cooperation under the human right to science and their allocation between different bearers. The first chapter specifies the content of the three kinds of duties and responsibilities of international scientific cooperation arising under the human right to science in the context of climate change, including from the perspective of systemic integration with the corresponding duties and responsibilities arising under other regimes of international law. The second one focuses on the allocation of the duties and responsibilities of international scientific cooperation between different bearers and spells out the criterion of ability arguably favoured by the CESCR over other criteria of allocation applicable to technology transfers, including the Global North/Global South divide. The third chapter turns to the institutional dimension of the duty of international scientific cooperation and articulates various reforms of existing national, transnational and international institutions of scientific cooperation with a special focus on the question of open access.

In her chapter 'Giving Substance to the Reinforced Duty of International Cooperation under the Human Right to Science in the Context of Climate Change', Katja Achermann examines the object and content of the 'reinforced duty of international cooperation' under the human right to science in the context of climate change. Drawing on recent case law, the chapter proposes to conceptualise the obligation to cooperate internationally as a component of a State's obligation to respect, to protect and to fulfil the human right to science of individuals within its jurisdiction. Although such a conceptualisation has received scant scholarly attention, it has various advantages, including a shift in focus from the question of what a human right to science perspective could add, to what international cooperation under the human right to science amounts to in the context of climate change. Answering this question, the contribution argues that respecting, protecting and fulfilling each of the scientific rights bundled under the human right to science has a cooperative dimension and illustrates this argument in the context of climate change.

Wouter Vandenhole's chapter 'Differentiated Allocation of International Cooperation Duties and Responsibility under the Human Right to Science'

starts from the observation that the Committee on Economic, Social and Cultural Rights has submitted that a 'reinforced' duty of international cooperation exists under the human right to science. It focuses on its content and how to allocate duties and responsibilities to States and other duty-bearers in a differentiated way, and how to identify specific obligations for specific States and other actors in such a differentiated approach. Vandenhole's contribution engages with these questions primarily from the perspective of international human rights law and the debates therein on extraterritorial and transnational obligations. It finds that the Committee has added more substance and detail to the duty of international cooperation in the context of the human right to science and possibly beyond, welcomes the ability model to establish how a duty of international cooperation can be attributed, and argues for further refinement of the differentiated allocation of duties and responsibilities beyond the Global North/Global South dichotomy.

In her chapter 'Operationalising International Cooperation to Protect Science as a Global System', Raffaela Kunz explores the potential of the right to science under Article 15 ICESCR to address global inequalities in the production and dissemination of scientific knowledge. Drawing on sociological systems theory, she argues that science operates as a global system transcending national boundaries but is constrained by national-level frameworks for its governance and protection. These structural misalignments exacerbate the marginalisation of researchers and institutions from the 'Global South' and perpetuate disparities in access to scientific resources and influence. The digital revolution, initially seen as a democratising force, has further entrenched existing inequalities due to the monopolisation of academic publishing and research infrastructures by a few powerful actors. The contribution thus proposes that the 'right to science' should be interpreted as containing next to individual rights an institutional dimension, protecting science as a global system. This dimension is derived from States' positive obligations to provide science in combination with their obligation to cooperate internationally. It concludes by proposing actionable measures to be taken under the 'right to science', including the regulation of monopolistic practices in academic publishing, the promotion of alternative open access models and the establishment of global mechanisms to ensure equitable participation in knowledge production.

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