

Evidence from Space and Its Validity in Legal Proceedings: Dispute Settlement in Light of the 2011 PCA Procedural Rules on Arbitration (2011)

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Abstract

A lot of water has gone under the bridge from the days a study on *Earth Observation data in the legal sector*, produced by the British Institute of International and Comparative Law (BIICL) in 2001, was referring to certain trouble arising from the use of satellite data in court and, therefore, questioning its validity as evidence. This announcement was based on experience in a few cases decided at the time by the ICJ and other international arbitrations concerning boundary disputes. This situation was beginning to conspire against the use of the many advantages provided by space technologies -particularly the precision of the information collected- which would be downgraded by suspicion or lack of transparency.

The underlying problem was -and still is- the wide margin of interpretation of the technical expert called upon to interpret a digital map in court. The problem is aggravated in cases of international disputes over land and water involving highly sensitive issues of sovereignty.

It follows that questions surrounding the authentication of satellite data submitted to court are of paramount importance. It is indeed difficult to assert the validity of this data once it has gone through a long chain of interpretations from the moment it is collected, as primary data and which cannot be modified, to the time the end product is made use of in court. There are no international standards agreed on this topic. The problem, as it stands today, is a matter of concern to practitioners and to the academic world as well. In the first place, disputes are likely to occur.

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The objective of this paper is to explore, in Part A, ways and means of overcoming these situations. International standards would no doubt be helpful in case of dispute over the value of satellite evidence and related issues. Likewise, in Part B, the possibility of resorting to the new Optional Rules for Arbitration of Disputes Relating to Outer Space Activities, procedural in nature and specifically drafted, designed and adopted in 2011 by the Permanent Court of Arbitration for application in that field, will be open to discussion.

A Satellite Data in International Litigation

The International Law Association (ILA) began focusing on these issues from an early stage. The first step was to examine the major problems involved at its 70th Conference¹ (New Delhi 2002) in response to a deep study concluded on 22 June 2001 by the British Institute of International and Comparative Law (BIICL)², as pointed out in the introduction to this paper. The study was prompted by a number of cases - decided by the ICJ and the PCA during the nineties and beginning of the new millennium - where maps based on satellite data were produced as evidence, their validity raising a string of divergent opinions. Inter alia, Botswana/Namibia (judgement of 13 December 1999), Qatar/Bahrain (23 March 2001) and Cameroon (10 October 2002) were leading cases on the matter decided by the ICJ. The PCA, for its part, confronted similar problems in the Yemen/Eritrea award (17 December 1999). The outcome was that the interpretation of satellite data was conflictive and, instead of having a clarifying effect for the courts, it created confusion³.

In more recent times the Caribbean area -where a number of longstanding boundary disputes involving neighbouring states have been taken to the ICJ to decide- clearly shows that certain issues remain outstanding. An illustrative example is provided by the views of experts working in the region for the production of digital maps to be submitted to the ICJ⁴.

The problem was brought to the attention of regional institutions as well. To mention only a few the Ibero -American Institute of Air and Space Law examined the question in October 2003 at a meeting in Montevideo where the advantages and shortcomings of satellite data in court and its value as evidence

1 *Report of the Seventieth Conference* (New Delhi 2002), 212.

2 The BIICL study concerned *Applications of Earth Observation to the Legal Sector* and may be found on its website: www.biicl.org. The Group consisted of lawyers and experts who shared their experience in the interpretation of satellite data and its submission as evidence to courts and tribunals.

3 See the BIICL study on applications of *Earth Observation to the Legal Sector*, *supra*.

4 See, inter alia, the proceedings of a Workshop on *Evidence from Space* held in London on 5 October 2010, organised by the London Institute of Space Policy and Law and the European Space Agency which reflects the current situation.

were initially analysed in that context⁵ and reviewed in 2011⁶. On 6 April 2005 the European Centre of Space Law organised a Conference at Surrey University (UK point of contact) entitled “*Current Issues in Earth Observation*” where the issue of satellite imagery in court was especially addressed.

Be that as it may the situation today seems clearer and possibly less dramatic than in earlier times. In fact, in the initial stages of this technology as applied in legal proceedings, when the ICJ was called upon to decide in the Burkina Faso/Mali boundary dispute in 1986, it held that digital maps were not binding documents or a territorial title by themselves, whatever their precision and technical value, unless the parties had previously agreed on the value of this means of evidence.⁷ This judgment entailed a rather gloomy outlook for the future of satellite imagery as evidence in court.

The production of satellite imagery at the stage of evidence is nowadays frequent. Yet, on some occasions, international judges may request other supporting evidence, such as aerial photographs and the like. In fact, as Kopal observed in his comments to the ILA Reports for Rio de Janeiro and The Hague⁸, the international community was not yet aware of the multiple applications of remote sensing and their legal implications.

Indeed, raw data, in its initial stage, cannot be modified. The issue lies in the manipulation of digital data as the outcome of a long chain of interpretations once the raw data has been collected by the satellite. This is particularly sensitive where boundary disputes are concerned, involving sovereignty questions over land and water.

One of the outstanding questions is the handling of digital images - which amount to a collection of data - without a possibility of detecting changes at a later stage. The difference between satellite data and other conventional means of evidence is not merely the higher precision of the former, which leaves no space for human error, but the very wide margin for interpretation left to the expert. This is not a procedural question but rather, a substantial one. The main pitfall is that obscuring, moving or introducing elements to digital images may be largely invisible to the human eye. This implies an inevitable dependence

5 See XXXII *Jornadas Iberoamericanas de Derecho Aeronáutico y del Espacio y de la Aviación Comercial*, Ed. Fundación AENA, Madrid 2008, chapter by the present writer on *Actividades comerciales en el Espacio: la observación de la Tierra*, 195-207.

6 See XXXIX *Jornadas Iberoamericanas de Derecho Aeronáutico y del Espacio*, Asunción del Paraguay, 2008, chapter by the present writer *Las tecnologías espaciales al servicio de las telecomunicaciones, la observación de la Tierra y otras aplicaciones en el mundo de hoy*, 121-141.

7 ICJ Reports 186, paragraphs 54-55-56.

8 See the *Annexes to the Reports of the ILA Space Law Committee* (Rio de Janeiro and The Hague) containing Professor V. Kopal's observations in *Report of the Seventy-Third Conference* (2008), 650-652, and *Report of the Seventy-Fourth Conference* (2010), 279-280.

on the experts called upon to interpret the data which, in turn, makes judges, arbitrators and lawyers particularly uneasy. What follows is a summary of the views of the doctrine over the last decade.

The Doctrine

A thorough analysis of the issues at stake was carried out by the ILA at its authentication methods followed up at the Seventy-First Conference in Berlin (2004) and continued to date. The conclusions and recommendations, at this stage, proved of undoubted interest to practitioners and academics alike.

The view was expressed that the satellite image submitted to court was the result of a long chain of interpretations, a situation which called for caution in court proceedings. Part of the doctrine was in favour of drafting a model statute to preserve the integrity of the data collected, with penalties for wilful or negligent misrepresentation. Others disagreed with the view that higher precision was the only difference between evidence obtained by earth observation satellites and evidence supplied by more traditional means (aerial or terrestrial). In fact, should a conventional photograph be altered, an expert could, at a later stage, prove manipulation. Conversely, in the case of a collection of satellite data -e.g. numbered images- changes may happen without the possibility of an *a posteriori* detection. Thus, the process should be supervised from the moment the raw data is collected until it is used in court (this idea was further developed in later years and served as basis for drafting recommendations for the 2012 ILA Conference in Sofia). The possibility of drafting basic rules on the matter, as guidelines for interpretation, was beginning to gain ground⁹.

The problem was revisited by the present author in a discussion paper submitted to a UN/Brazil Workshop in 2004¹⁰ and commented by **Montserrat** and **Gabrynowicz**. Both these authors made pointed remarks on the suspicion surrounding digital imagery as evidence in court. One of the main reasons was the deficiencies in the authentication methods¹¹. The subject was followed up at the 48th Colloquium of the International Institute of Space Law (IISL) in Fukuoka (October 2005)¹².

A general opinion could already be detected whereby the advantages - particularly the precision - of this new technology should be preserved and be given a more positive spin to confront suspicions of manipulation of digital data which was reaching other areas as well, particularly in the field of biology. *The Journal of Cell Biology* (US), for example, was using a test whereby the manuscripts

9 For further details see *Report of the Seventy-First Conference.... (2004)*, 749-751.

10 See, by the present writer *Remote Sensing and International Law, UN/Brazil Workshop on Space Law*, Rio de Janeiro, November 2004, published by UN Vienna in 2005, 132-135.

11 Ibid. J. Gabrynowicz, 158.

12 *Proceedings of the Forty-Eighth Colloquium on the Law of Outer Space*, Fukuoka 2005, published by the American Institute of Aeronautics and Astronautics.

were being run through Photoshop,¹³ a procedure which revealed extensive photo-manipulation and misrepresentation of data in breach of the Journal's guidelines.

Briefly, at this stage the doctrine was divided. Lawyers and judges continued to have conflicting views on the subject, many of them showing mistrust where satellite imagery as a means of evidence was concerned.

Towards the end of the first decade of the new millennium a certain practice was noted on the use, as working tool, of a description of the various stages involved in the elaboration of digital maps as listed by **Harald Guinzky**¹⁴ in 2005 as follows.

- 1 The raw - or primary - data is collected by the satellite. In this initial stage is unprocessed and has no real value.
- 2 The first step, generally called 'pre-processing', is meant for radiometric and geometric corrections and atmospheric changes relating to spacecraft attitude, among others.
- 3 The next step is when the raw data is available in digital form and certain parts of the image may be enhanced, at the user's request, by computers.
- 4 In a following stage the user may ask for a classification of the collected information by a majority of the bringing together, for example, similarities and differences.
- 5 Some additional information, like maps, GPS data and so forth, may be added to complete the interpretation of the satellite image.

The scientists, for their part, were observing that one of the reasons for pre-processing raw data was the continual non-ideal position of the orbit and spacecraft attitude (yaw, pitch and roll) and that some corrections were needed to ensure the image was not distorted. In an effort to provide solutions, he suggested that remote sensing satellite operators be required to keep archives with a record of the raw data so that it would be possible to return to it when manipulation was suspected.

In the Report of the International Law Association to the Río de Janeiro Conference (2008) **Purdy** stressed the importance of training the legal sector in the development of these technologies given the unawareness of what this technology can offer and its limitations. There might be greater public awareness of satellite technologies through internet programmes such as Google Earth - downloaded by millions- but many in the legal sector have probably never seen a satellite image in a legal context¹⁵.

Therefore, towards the end of the first decade of the new millennium the key words underlying the problems of satellite data in court were, undoubtedly,

13 See *The Buenos Aires Herald*, Vol. 6, NO 258, 'On Sunday with the New York Times', 20.

14 Ginzky, H., *Satellite Images as evidence in Legal Proceedings relating to the Environment - A US Perspective*, Air and Space Law, Vol. XXV, Kluwer 2000, 115.

15 For further detail on these positions see *Report of the Seventy-Third Conference* (Río de Janeiro 2008), 631-637.

capacity building and the creation of awareness in the legal sector plus a strict control of the process of data collection until it became an end product. Furthermore, the idea of keeping raw data in archives for later consultation was seen with favour¹⁶ by a majority of the doctrine.

At this point in time the view of the publicists began to draw attention to what were considered two very practical aspects of remote sensing today, namely, the use of remote sensing for supervising compliance with international obligations - particularly in the field of environmental law, the use of satellite data for the management of water resources and satellite data as evidence in international litigation¹⁷.

Purdy's latest experience in Australia¹⁸ resulting from a project on this specific question conducted from University College London is of special interest¹⁹. In similar manner the ILA Report to its 74th Conference (The Hague 2010) made a reference to the experience of the present writer in an international conference in Buenos Aires in 2008, organised by the national space agency of Argentina (CONAE) and the European Space Agency (ESA), with the auspices of CONICET/University of Buenos Aires and the University of Belgrano at Buenos Aires, to discuss the value of satellite data in national and international courts from a strictly interdisciplinary approach. The general opinion was that modifying raw data, in its initial stage, was not possible and that strict control over data collection should exist from the very beginning up to the moment it was produced as evidence in court. Moreover, it was agreed that the most controversial issues arose in cases of international boundary disputes involving thorny issues of sovereignty²⁰.

During the working session of the ILA Space Law Committee at The Hague a stimulating exchange of views was registered. It was observed that, even if guidelines were adopted regarding the production of satellite imagery in court, the court would always remain the final authority to decide on the credibility of such evidence. It was further noted that the crucial point was to ensure the authenticity of the data which implied that data archives ought to be standardised and, once data is stored, it should not be manipulated. If in doubt, as observed earlier, there would be a possibility of returning to the archives to access the data in its original form. And the view was expressed that references to the use

16 CONICET (National Council for Scientific Research of Argentina) had at that time a Project underway, conducted by the present writer, which specifically emphasised is on satellite data in national and international litigation. (Proyecto PIurianual 5718).

17 *Report of the Seventy-Third Conference...2008*, 636. Also *Report of the Seventy-Fourth Conference* (The Hague 2010), 267.

18 <www.ucl.ac.uk/laws/environment/satellites for further details on Purdy's project>.

19 See, for further details, <www.space-institute.org>, London Institute of Space Policy and Law, ISPL/ESA Project, workshop *Evidence from Space*, London 5 October 2010.

20 See Report of the ILA *Seventy-Third Conference, Río de Janeiro 2008*, 635. The question of 'boundary disputes and sovereignty' was taken up as a point of contention at The Hague, *Report of the Seventy-Fourth Conference... 2010*, 267.

of satellite data and space technologies in international treaties would be useful to create awareness²¹.

All in all satellite data, when used as evidence in court, appears less controversial in national courts where the submitted information has already been certified by the local authority. However so, some recommendations and perceptions on the matter may be outlined, as follows.

- 1 The point of substance is that, unlike traditional photography where changes or manipulations are easy to establish, data collected by remote sensing technologies may be manipulated with no possibility of detecting *ex post facto* changes.
- 2 For that reason strict control of the whole process of data collection and interpretation is essential, from the moment the data is obtained (as raw data) until it becomes an end product for submission to court.
- 3 An international body should be in charge of, and made responsible for, the accreditation and certification of satellite data. Authentication, in this context, is a key word.
- 4 Following a traditional practice in other legal areas it is recommended to have a list of experts of international prestige from which the parties to a dispute and judges/arbitrators may be able to choose.
- 5 A helpful step would be the sealing of archives containing the raw data once collected, and to which it would always be possible to return in controversial situations.
- 6 The training of the legal sector in the development of these technologies is a priority given the current unawareness as to what this technology can offer.
- 7 The issues surrounding satellite data in international litigation, and their development, should be kept under permanent review by the doctrine and other institutions involved with particular emphasis on the production of satellite data in international boundary disputes where sensitive situations arising from claims of sovereignty are more likely to occur.

The ILA latest findings on the value of satellite data as evidence in court have been submitted to its Seventy-Fifth Conference in Sofia (August 2012) and may be found in the Report of its Space Law Committee on the ILA website²².

B Dispute Settlement and the new Rules of the Permanent Court of Arbitration (PCA)

This recent development in the framework of the PCA is a landmark of major importance in the field. To say the least, the PCA New Rules on Outer Space appear as a useful tool for a prompt and amicable settlement of disputes arising from the use of space technologies, which is growing by leaps and

21 *Report of the Seventy-Fourth Conference...2010*, 260-290.

22 For further details on the Report submitted to this Conference by the ILA Space Law Committee see <www.ila-hq.org> (click on 'committees' and then on 'space law').

bounds involving both industrialised and developing countries. Moreover, having in mind that space technologies are essentially of a commercial nature in today's world, disputes are more likely to happen giving way to a myriad of questions, sub-questions and uncertainties, mostly linked to technological development.

It is fair to say the dispute settlement mechanisms envisaged by the UN Treaties on Outer Space Treaties, and by UN Principles, have not been able to show their effectiveness so far. It is submitted that, *per contra*, the PCA Optional Rules for *Arbitration of Disputes Relating to Outer Space Activities* will go a long way in meeting its objective of easing procedures in these fields and, most importantly, in issues relating to satellite data in international litigation and its validity as evidence in court.

The *PCA Optional Rules for Arbitration of Disputes relating to Outer Space Activities* -hereinafter referred to as the 'PCA Rules on Outer Space' or 'PCA Outer Space Rules'- adopted by the 184th Administrative Council of the PCA on 6 December 2011 and currently in force, were the result of a dedicated effort, over the span of two years, of an international Advisory Group of Experts under the skilful conduction of Judge Fausto Pocar²³ as Chair, and together with the International Bureau of the PCA. The Final Text of the Optional Rules, as adopted, is available in English and French on the PCA website²⁴. In March 2012 these Rules were introduced and explained to the Legal Subcommittee of COPUOS and recorded in the Report of that Legal Subcommittee on its Fifty-first Session²⁵.

These Rules are a follow up to the *PCA Rules for Arbitration of Disputes Relating to Natural Resources and /or the Environment*, an area of close points of contact with the use of space technologies in the current international context. The present writer, in a recent Report submitted to the ILA Seventy-Fifth Conference (Sofia, August 2012) includes a chapter on dispute resolution and examines the salient parts of the PCA New Rules which, with additions, updating and further thoughts, are summarised below. In so doing, I shall turn, specifically, to what we intended to achieve.

The Rules are procedural in nature and stand out for their flexibility, particularly as regards applicable law. Moreover, they show a realistic equilibrium among the different elements and interests involved. The need for these rules, and their objectives, appeared very clearly from the outset. Indeed the adopted Rules should go a long way in avoiding the frustration of arbitration procedures by claims of sovereign immunity. This objective was, by and large, a priority in the view of the PCA Advisory Group and its Chair. With the adoption

23 The members of the Group of Experts participating in the drafting of the Optional Rules were Tare Brisibe, Frans von der Dunk, Joanne Gabrynowicz, Ram Jakhu, Arnel Kerrest, Justine Limpitlaw, Francis Lyall, V.S. Mani, José Monserrat Filho, Stephan Hobe, Maureen Williams and Haifeng Zhao.

24 <www.pca-cpa.org>.

25 Doc. A/AC.105/1003, 11-12 (paragraph 62).

of these new Rules a distinct step forward has been given in the field of dispute settlement relating to outer space activities.

The Rules took as basis the *PCA Environmental Rules* and the *2010 UNCITRAL Arbitration Rules* but departed from them in certain cases so as to make them more specific and consistent with the new international scenarios in which the Advisory Group was involved and the special features of the law of outer space.

One of the sources of inspiration for the PCA work were the *ILA Conventions of 1984 and Revised Text 1998 on The Settlement of Disputes related to Space Activities* which, to date, remain under permanent study by the ILA Space Law Committee with a view to controlling their consistency with the advances of science and technology. These texts were already reflecting a reality of our time when stating that dispute settlement procedures shall be open to entities other than states and international intergovernmental organisations (Article 10 (b) in both texts). These provisions should be read together with Article VI of the 1967 Outer Space Treaty concerning the international responsibility of States for national activities in outer space, the moon and other celestial bodies, which entails an obligation to authorise and supervise the activities of non-governmental entities in those areas.

The comments from the PCA member states -currently one hundred and fifteen of them- during the drafting history of the Outer Space Rules were most valuable, both in essence and form, and worthy of the deep consideration given to them by the Advisory Group and its leader.

In the first place the Advisory Group looked for durable solutions on the matter. As experience has often shown, flexibility and general principles are usually less brittle and more likely to survive the times than detailed regulation. Hence the idea of the Advisory Group to begin at a low level of compulsion and, at a later stage, gradually move forward by means of international standards or guidelines giving more precision to the general provisions of the *PCA Outer Space Rules*.

Secondly, the Group agreed on the need to revitalise the existing mechanisms for dispute settlement relating to space activities which were laid down in the early stages of the exploration and use of outer space and nowadays called for revision.

Other opinions indicated the need for the Outer Space Rules to be compatible with the public international law system of dispute settlement embodied in the 1972 Liability Convention further adding that, in order to prevent a conflict of laws, the Rules ought to be refined.

In fact, it is submitted that Article XII of the Liability Convention on applicable law does not raise a problem of conflict of laws and should be seen as a rule of public international law proper, altogether compatible with the PCA Outer Space Rules. Furthermore, the PCA Rules are procedural and do not include provisions of substance. Therefore they dissipate the risk of a 'double recovery'.

There was a certain amount of questioning during the drafting process of the Rules over the scope and implications of the terms 'classified information' and

‘confidentiality’ embodied in Article 17 (7) and 17 (8) which was later overcome and Article 17, thus, remained in its original reading²⁶.

Many of the comments from the PCA member states were suggesting the addition of further details to the then Draft Rules which, in general, the Advisory Group did not include for practical reasons and bearing in mind the special features of the topic addressed.

In addition to disputes between sovereign states, the *PCA Outer Space Rules* clearly apply to disputes between international intergovernmental organisations and private parties. It is essential to highlight this fact and to have in mind that we are dealing with *ad hoc* arbitration. This approach, as noted above, eases the way to dispute settlement mechanisms and minimises the risk of sovereign immunity exceptions being brought up at some stage upsetting the normal course of dispute settlement procedures.

In brief, the PCA Rules (2011) provide an interesting example of progressive development of the law particularly when covering a number of outstanding *lacunae* in international space law. It is submitted that insofar as dispute settlement relating to the use of space technologies is concerned, arbitration appears as the best solution particularly, as observed earlier, in disputes surrounding the use of satellite data in court to which we may add, at this point in time and as part of a non-exhaustive list, space debris issues, telecommunications and remote sensing in general.

The Chair of the PCA Advisory Group, as previously recorded, introduced and explained the striking features of the *Outer Space Rules* to the United Nations at the Fifty-first Session of the Legal Subcommittee of COPUOS on 29 March 2012. On this occasion Judge Pocar summed up the main reasons for arbitration being particularly indicated in the field of space law disputes in the following terms.

- Arbitration is open to all parties active in the field, both public and private.
- As reflected in Article 1 of the *PCA Outer Space Rules*, arbitration is a voluntary mechanism based on the consent of all parties, which can be provided

26 Article 17 (7) of the PCA Rules provides *The arbitral tribunal shall determine whether the information is to be classified as confidential and of such a nature that the absence of special measures of protection in the proceedings would be likely to cause harm to the party or parties invoking its confidentiality. If the arbitral tribunal so determines, it shall decide and communicate in writing to the parties and the International Bureau under what conditions and to whom the confidential information may in part or in whole be disclosed and shall require any person to whom the confidential information is to be disclosed to sign an appropriate confidentiality undertaking.* Article 17 (8) provides *The arbitral tribunal may also, at the request of a party or on its own motion, appoint a confidentiality adviser as an expert in accordance with Article 29 in order to report to it on the basis of the confidential information on specific issues designated by the arbitral tribunal without disclosing the confidential information either to the party from whom the confidential information does not originate or to the arbitral tribunal.*

by insertion of an arbitration clause in the Legal instrument that defines the parties' relationship, as confirmed in Article 1 (1) of the Rules²⁷.

- This is of particular importance where states are concerned, as they may be better prepared to agree to a binding dispute resolution under discrete agreements than to enter into a new significant multilateral treaty.
- Arbitration results in final and binding decisions, as set forth in Article 4 (2) of the Rules, in contrast with the recommendatory nature of decisions under, for example, the
- 1972 Liability Convention.
- Arbitral awards are internationally recognised and enforceable in all signatory states of the New York Convention, currently one hundred and forty-six.
- Parties to arbitration choose their own decision makers. Unlike in a court, parties in arbitration have the option of selecting arbitrators with specialised competences in the relevant fields, which may be as diverse as economics, cutting-edge space technology, and a tangle of related scientific branches.
- Arbitral procedure is flexible and can be modified by agreement of the parties, as provided in Article 1 (1) of the Rules, and
- Arbitration can serve to preserve the confidentiality of sensitive information. Hearings need not be public and awards need not be published, as provided in Articles 28 (3) and 34 (5) of the Rules²⁸.

Conclusion

There is much to be said for the great flexibility of the PCA Rules and their procedural nature. Therefore, rather than weakening the force of the dispute settlement clauses embodied in the UN Space Treaties and Principles, the new PCA Rules should have a constructive role in revitalising and enriching the existing procedures.

27 Article 1 (1) states: *Where parties have agreed that disputes between them in respect of a defined legal relationship, whether contractual or not, shall be referred to arbitration under the Permanent Court of Arbitration Optional Rules for Arbitration of Disputes relating to Outer Space Activities, then such disputes shall be settled in accordance with these Rules subject to such modification as the Parties may agree. The characterisation of the dispute as relating to outer space is not necessary for jurisdiction where parties have agreed to settle a specific dispute under these Rules.*

28 Article 28 (3) provides that *Hearings shall be held 'in camera' unless the parties agree otherwise. The arbitral tribunal may require the retirement of any witness or witnesses, including expert witnesses, during the testimony of such other witnesses, except that a witness, including an expert witness, who is a party to the arbitration shall not, in principle, be asked to retire.* Article 34 (5) states that *An award may be made public with the consent of all parties or where and to the extent disclosure is required of a party by legal duty, to protect or pursue a legal right or in relation to legal proceedings before a court or other competent authority.*

A cursory glance at the *PCA Outer Space Rules* nearest precedent, i.e. *the Optional Rules for Arbitration of Disputes Relating to Natural Resources and/or the Environment*, also procedural, reveals that the subject matter is very close to that of space activities. Hence, a fruitful interaction between both sets of Rules seems both desirable and expected before too long.

Both areas are highly influenced by technological development of which glaring examples are the use of satellites for monitoring compliance with international agreements, particularly concerning the management of water resources, climate change and the protection of the ozone layer.

The general opinion concurs that the time is right for having procedural rules on dispute settlement relating to outer space activities and that, possibly in the medium term, the PCA would provide an excellent forum for the settlement of disputes arising from the exploration and use of outer space and celestial bodies, as well as from the exploitation of those areas.