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FOREWORD

THE JOURNAL OF SPACE LAW: 30TH ANNIVERSARY

Joanne Irene Gabrynowicz[1]

"The longer you look back, the further you can look forward."
--Winston Churchill

This volume marks the 30th anniversary[2] of the JOURNAL OF SPACE LAW. Thirty years ago, the *Salyuts* and *Skylabs* of the Soviet Union and the United States were the center of human space activities. In planetary space, the focus was Mercury, Mars and beyond. *Mariner 10* launched and became the United States', and history's, only Mercury mission. The Soviets launched three Mars missions. The United States' *Pioneer 11* launched and then explored Jupiter and Saturn. It later became the second spacecraft to leave the solar system. Numerous launch vehicles carried scores of communications, remote sensing, weather, environmental, life sciences and national security satellites into orbit. The names *Aeros, Agena, Altair, Anik, ANS,*[3] *Atlas, ATS,*[4] *Aureole, BMEWS,*[5] *Burner, Copernicus, Cosmos, DMSP,*[6] *DSCS,*[7] *Explorer, Hawkeye, Helios, IMEWS,*[8] *Inter-*

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[2] The numerical anniversary would have been 2003. However, no issue was published in 2002 due to the death of the JOURNAL OF SPACE LAW's founder, Dr. Stephen Gorove. Therefore, 2004 is the 30th production anniversary.

[3] Astronomical Netherlands Satellite

[4] Applications Technology Satellite

[5] Ballistic Missile Early Warning System

[6] Defense Meteorological Support Program

[7] Defense Satellite Communication System

[8] Integrated Missile Early Warning Satellite

cosmos, *Intasat*, *ITOS*,[9] *Luna*, *Mars*, *Meteor*, *Miranda*, *Molniya*, *NTS*,[10] *Oscar*, *Pioneer*, *Prognoz*, *San Marco*, *SDS*,[11] *SESP*,[12] *SMS*,[13] *Soyuz*, *Symphonie*, *Tansei*, *Telesat*, *Titan*, *Transtage*, and *Westar* entered or continued in the space lexicon.[14]

In 2004, human spaceflight centers on the 16-nation *International Space Station*. The focus of planetary science is Mars, Saturn, comets and asteroids. The United States' rovers, *Opportunity* and *Spirit* are on the surface of Mars, and the European Space Agency's (ESA) *Mars Express* is in its orbit. All have returned historic data. ESA's *Rosetta* mission is on its way to Comet 67P and the United States' *Deep Impact* is set to be launched toward Comet Tempel 1. The Moon continues to be a destination of interest and ESA's *Smart 1* is currently en route. The United States and Europe are almost at Saturn and its Moon, Titan, with their respective missions, *Cassini* and *Huygens*. Japan's *Hayabusa* completed its Earth swing-by and is well on its way to the asteroid Itokawa. In physics, *Gravity Probe- B* is testing two of Albert Einstein's predictions of general relativity. Launch vehicles continue to transport numerous application satellites into space that carry out the many services upon which humanity has come to rely.

On a smaller time scale, since the last volume of the JOURNAL OF SPACE LAW, United States President George W. Bush announced that the United States has a new direction in civil space activities: returning to the Moon permanently and then on to Mars. Important steps were taken toward establishing global environmental monitoring systems. The Group on Earth Observations held the second Earth Observation Summit in Tokyo and adopted a Framework Document for a 10-Year Implementation. The European Commission is developing a

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[9] Improved TIROS Operational Satellite

[10] Navigation Technology Satellite

[11] Satellite Data System

[12] Space Experiments Support Program

[13] Synchronous Meteorological Satellite

[14] DESMOND G. KING-HELE, ET AL., THE R.A.E. TABLE OF EARTH SATELLITES 1957 - 1989, 320-389 (Royal Aerospace Establishment, Famborough, Hants, 4th ed. 1990) (this list is for 1973 – 1974).

white paper to define a Global Monitoring for Environment and Security strategy.

In terms of the exploration and use of space, reasonable people may hold different views as to whether progress has been made in the last thirty years or whether the *status quo* has simply been maintained. However in legal terms, all would have to agree that one thing has changed. There is now a new generation of space lawyers entering the field, bringing with them the unique perspective of their generation. For them, *Apollo* was something that happened in their parents' generation. They were infants when the *Skylabs* and *Salyuts* were the focus of space activities. This generation of space lawyers is as likely to deal with issues of space tourism liability as it is with international public space law.

Another new trend is the expansion of the space law community with a complement of specialists from other bodies of law. The complexity of satellite financing, for example, has catalyzed the private international financing law community to promulgate the Convention on International Interests in Mobile Equipment[15] and its Preliminary Draft Protocol on Matters Specific to Space Assets.[16]

President Bush's announcement already has space lawyers, the new generation and the more experienced, revisiting treaty negotiation histories. The global monitoring plans are raising long-term legal issues being addressed by space lawyers and non-space lawyers alike. The nascent legal foundation of these activities, including the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters[17] is challenging signatories to define

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[15] Convention on International Interests in Mobile Equipment, Nov. 16, 2001, UN Doc. No. A/AC.105/C.2/2002/CRP.3 (now referred to as the Cape Town Convention).

[16] Preliminary Draft Protocol on Matters Specific to Space Assets, UNIDROIT 2004, Study LXXIIJ, Doc. 13, *available at* http://www.unidroit.org/english/workprogramme/study072/history.htm (last visited April 24, 2004).

[17] Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters, *available at* http://www.disasters-charter.org/charter_e.html (last visited April 24, 2004).

"space data" and "space facilities" as well as "crisis" and "natural or technological disaster."[18]

The 30th Anniversary issue of the JOURNAL OF SPACE LAW reflects these important space law trends. It includes articles from George S. Robinson and Frans G. von der Dunk, established and well-respected space lawyers, as well as Anna Marie Balsano, Aude de Clercq, Donna M. Shafer, and Amy Voight LeConey, members of the new generation of space lawyers. There is also an article by Hans P. Sinha, a Swedish native, international criminal law expert and professor of clinical criminal law. He examines the jurisdiction provisions of the *International Space Station* Intergovernmental Agreement from the perspective of international criminal law. Representing the space law student community—the source of both future space lawyers and other specialists—is a paper by Maria Nikolaevna Bjornerud, a native Russian speaker and an official translator, and a law student. She also translated the legal agreements appended to her paper. Another law student, Tracy Bowles, contributed the updated space law bibliography.

On the 60th anniversary of the JOURNAL OF SPACE LAW, one can imagine the then Editor-in-Chief sitting down to write the foreword to the anniversary volume. That Editor might think it a good idea to compare space activities as they existed at the time of the JOURNAL's founding with the space activities of 2034. It is harder to imagine what that comparison might look like. Nonetheless, that Editor will be able to say what this Editor is saying: one thing is certain. There will be a new generation of space lawyers and visiting experts from other fields to serve humanity as it continues its journey in exploring and using space.

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[18] *Id.* at art. 1.

THE COMMUNITY PATENT AND SPACE-RELATED INVENTIONS

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I. INTRODUCTION

Can inventions made in outer space be patented on Earth? Can the use of patented inventions be protected in outer space? These two questions lacked clear answers before the European Council reached agreement on a common political approach regarding the Community Patent Regulation (Regulation) in March 2003.[1] This paper will demonstrate that the answers to these questions are in the affirmative.

The Regulation, long awaited by intellectual property specialists and industry, will create a unitary patent valid Community-wide with centralised and simplified procedures. But it is also an important instrument for reasons specifically pertinent to space activities. The Regulation is made explicitly applicable to inventions created or used in outer space, including on celestial bodies or on spacecraft which are under the jurisdiction and control of one or more Member States (Article 3).[2]

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[1] Proposal for a Council Regulation on the Community Patent. Ref., COM(00)412 final; 2000/0177 (CNS) Brussels, *available at* http://register.consilium.eu.int/pdf/en/03/st08/st08539en03.pdf (Jan. 8, 2000) [hereinafter Proposal].

[2] *Id.* at art 3, §2, p. 38, "This regulation shall apply to inventions created or used in outer space, including on celestial bodies or on spacecraft, which are under the jurisdiction and control of one or more Member States in accordance with international law."

II. MAIN ISSUES SURROUNDING SPACE-RELATED INVENTIONS

The issue of patentability of space-related inventions is becoming increasingly important, especially with the International Space Station (ISS)[3] nearing completion. The ISS, one of the most important examples of cooperation among spacefaring nations, is the most appropriate test case for reviewing the effect of the regulatory environment with respect to intellectual property rights in outer space. This is because the astronauts' long-term presence in the ISS research environment could lead to inventions eligible for patent protection. Similarly, patented inventions made on Earth will be used in the Space Station.

For what kinds of experiments could the ISS be used? Human physiology, medicine, biology, physical science or the pharmaceutical sector have been identified as areas which will definitely benefit from use of the ISS. If we take the pharmaceutical field for instance, the production of Interferon is extremely difficult on Earth and the conditions, due to the environment in outer space, might be more suitable.

Let us then assume that a scientist/astronaut invents a medicine while on board the ISS. Which patent law will be applicable to protect such a research result in space? And if this result is patentable, can the owner be protected against an unauthorised use, infringement, of the patented invention made in outer space?

In principle, national and international patents are enforceable only within the territorial boundaries of designated countries. Outer space, like the high seas and Antarctica, is not subject to national appropriation and does not fall under any national sovereignty. This implies that outer space cannot be appropriated by use or claim or any other means.[4] With regard

[3] The International Space Station (ISS) is a co-operative programme between Europe (eleven (11) European Space Agency Member States), the United States, Russia, Canada, and Japan for the joint development, operation and utilisation of a permanently inhabited Space Station in low-Earth orbit.

[4] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, art. II, 18 U.S.T. 2410, 610 U.N.T.S. 205 (entered into force on Oct. 10, 1967) [hereinafter Outer Space Treaty].

to applicability of national patent regulations, problems occur when an invention is used or infringed in outer space, because these regulations are applicable only on the territory of the specified State which, by definition, excludes the extraterritorial domain of outer space.

Nonetheless, a State retains jurisdiction and control over objects it sends into outer space.[5] Hence, the simple solution to this legal gap would be to make patent law applicable to space objects under the jurisdiction and control of a given country. This is exactly what was done by the United States in November 1990. According to the U.S. Patent Act any invention made, used or sold in outer space on board a spacecraft under the jurisdiction or control of the US is considered to be made, used or sold on U.S. territory except where an international agreement has been concluded.[6] With the exception of the United States, only Germany modified (de facto)[7] its patent law when signing the Intergovernmental Agreement (IGA)[8] on the ISS to make its patent law applicable to inventions created on board a European Space Agency (ESA) registered module. Apart from these two examples, the national patent laws of other countries do not contain provisions that would make the national patent law applicable on board a spacecraft.

[5] *Id.* at. art. VIII. "A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body. Ownership of objects launched into outer space including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return."

[6] 35 U.S.C. § 105 (2003). The U.S. Patent Act is found in Title 35 of the U.S. Code and contains Federal statutes governing patent law in the United States. In Chapter 10, entitled "Patentability of Inventions", Section 105 deals explicitly with inventions in outer space.

[7] German Act of 13 July 1990 on the Ratification of the IGA, 1988 BJBL. II 637.

[8] Agreement Among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, Jan. 29, 1998, *available at* 1998 U.S.T. LEXIS 212 (entered into force Mar. 27, 2001) [hereinafter IGA].

With the development of space-related projects such as the ISS, involving a great deal of cooperation among partner States, there is a need for harmonisation of patent laws. It has also been widely accepted that the most obvious solution for a nation that wants certainty in protecting its technology is to follow the U.S. example. With Europe becoming more and more integrated, the Community Patent Regulation appears to be the most appropriate instrument to bring solutions to the needs and problems described above.

III. INVENTIONS MADE IN OUTER SPACE AND THE COMMUNITY PATENT

A. The Community Patent

Discussions on the creation of a Community Patent were launched by the Green Paper of 24 June 1997 on the Community Patent and the European Patent System.[9] Later, the importance of introducing a Community Patent without delay was reasserted at the European Council meeting in Lisbon on 23 and 24 March 2000.[10] The outcome was a proposal for a Regulation presented by the Commission, the text of which was agreed on by the Member States on 3 March 2003. This Regulation replaces, and is mostly based on, the Community Patent Convention, which was agreed on in Luxembourg in 1989 but never entered into force.[11]

It basically seeks to create a unitary industrial property right in order to eliminate distortions of the internal European market which might result from the territorial nature of national protection rights; it is also one of the most suitable means of ensuring the free movement of goods protected by patents.[12] It

[9] Proposal, *supra* note 1, Explanatory Memorandum, at p. 5.

[10] *Id.*

[11] Agreement Relating to Community Patents, Dec. 15, 1989, 1989 O.J. (L 401) 1 [hereinafter Luxembourg Convention]. The Luxembourg Convention was signed in 1975 and amended in 1989. It aimed to give a unitary effect to European patents applied for in respect of community territory.

[12] Proposal, *supra* note 1, art. 2 §1, at p. 6.

will enable Europe to reap the full benefits of research and to stimulate private research and development investment.

Up until now, patent protection in Europe has been provided by two systems. The first is the national patent system, which are patents granted by national patent offices. The second is the European patent system, patents granted by the European Patent Office in Munich, based on the European Patent Convention signed in 1973 (Munich Convention).[13] The Munich Convention enables the patentee to apply for "a bundle of national patents" designating one or more Member States.[14] Yet the procedure is cumbersome, lengthy and costly. Moreover, in the event of disputes, national courts are competent so there could be twenty-four different legal proceedings with different procedural rules and the risk of different outcomes.[15]

That is why the objective of the Regulation is to create in Europe a system of patent protection based on a legal instrument that would simplify procedures, increase protection and reduce costs.

B. Characteristics of the Community Patent

The Community Patent can be described by three adjectives that succinctly summarise its objectives: unitary, affordable and autonomous. According to Article 2, "unitary" means that the Community Patent produces the same effect throughout the territory of the Community and may be granted, transferred, declared invalid or allowed to lapse only in respect of the whole of that territory.[16]

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[13] Convention on the Grant of European Patents, Oct. 5, 1973, 1065 U.N.T.S. 254 [hereinafter Munich Convention].

[14] *Id.* at art. 2.

[15] *See* discussion *infra* Part III.E for the implications in relation to the ISS and, in particular, vis-à-vis Article 21.4 of the IGA, *supra* note 8.

[16] Proposal, *supra* note 1, at art. 2.

"Affordable" means that the Community Patent is attractive since it is more economical than the existing European and national systems of protection.[17] To achieve this result, requirements regarding translations have been reviewed and reduced.[18]

Finally, "autonomous" means that the Community Patent is subject only to the provisions of the Community Patent Regulation and to the general principles of Community law. The Regulation introduces specific provisions applicable to Community Patents. It should be noted that the Community Patent Regulation embraces most of the substantive principles of the Munich Convention and national patent laws, such as for instance, the conditions of patentability.[19]

However, while the provisions of the Community Patent Regulation are in line with the Munich Convention, Article 3 introduces a new element to the provisions of the Munich Convention. It makes the Community Patent Regulation applicable to space-related inventions.[20]

C. *Article 3 of the Community Patent Regulation: Inventions Created or Used in Outer Space*

Article 3.2 of the Community Patent Regulation states, "this Regulation shall apply to inventions created or used in outer space, including on celestial bodies or on spacecraft, which are under the jurisdiction and control of one or more Member States in accordance with international law."[21] This provision, designed to protect inventions made or used in space, is essential in order to improve the competitiveness of European industry as compared, in particular, with that of the United States. It

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[17] *Id.* at p.10. "At present, an average European patent (designating eight Contracting States) costs approximately EUR 30,000. The fees due to the Office for such an average European patent account for approximately 14% of the total cost of the patent. The translation required by the Contracting States account for approximately 39% of the total cost."

[18] *Id.* at art. 24(a), §1. According to the proposed solution the cost of translating the patent documents into one of the Office's three working languages and the claims into the other two amounts to EUR 2,200.

[19] *See infra* n. 28.

[20] *Id.* at art. 3.

[21] *Id.* at art. 3.2.

is necessary in order to be in line with European commitment to the ISS.[22] Therefore, the Community Patent is applicable to any spacecraft in outer space if one or more Member States have jurisdiction and control over it.

Therefore, the answers to the questions asked at the beginning of this paper are in the affirmative, since the use of a patented invention in outer space will be protected by the Community legislation.[23] A European court will have jurisdiction to hear a case of unauthorised use of an invention in outer space.[24]

D. *Conditions for Community Patent Protection*

The conditions of patentability for a Community Patent are those laid down in the Munich Convention (Articles 52 to 57).[25] According to that Convention, "patents shall be granted for any inventions which are susceptible of industrial application, which are new and which involve an inventive step."[26] Those requirements are not new and are basically the same as in most European national laws since national laws have been harmonised with the Munich Convention. The fact that an invention has been made in outer space does not change the basic conditions of patentability.[27]

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[22] *See* discussion, *supra*, p. 1.

[23] *See supra* Part I.

[24] *See* discussion *infra* Part III.E.

[25] *See* Munich Convention, *supra* note 13.

[26] *Id.* at art. 52(1).

[27] *Id.* at arts. 52-57. The conditions of patentability are:

1) Novelty, which is assessed with regard to existing knowledge prior to a patent application. This means that prior disclosure to the public renders an invention unpatentable. If it is necessary to divulge the invention to a third party, for experimentation for instance, it is important to conclude a confidentiality agreement. The IGA covering the ISS sets rules concerning confidentiality but it would doubtless be very difficult to keep things secret in such an environment.

2) Inventive step, which means that the invention is not obvious for people skilled in the given technical field.

3) Industrial application is quite a broad condition, which implies that a product or process can be reproduced by industry.

E. *Jurisdiction*

A centralised Community jurisdiction, within the framework of the European Court of Justice, specialising in patent matters would best ensure unity of law and consistency of case law throughout contracting States.[28]

Within the framework of the ISS, the centralised jurisdiction of the Community Intellectual Property Court will give greater protection to intellectual property rights registered in more than one European ISS Partner State. In fact, according to Article 21.4 of the IGA,[29] if an act of infringement of intellectual property rights protected in several European Member States occurs in, or on, an ESA-registered element, the owner cannot

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[28] "The legal basis to be used for the establishment of a Community Patent jurisdiction was introduced into the EC Treaty by Article 2 (26 ff.) of the Treaty of Nice amending the Treaty on European Union, the Treaties establishing the European Communities and certain related acts which entered into force on 1 February 2003, inserting Article 229a and Article 225a into the EC Treaty." Proposal for a Council Decision conferring jurisdiction on the Court of Justice in disputes relating to the Community patent, Dec. 23, 2003,COM(03)827 final at 5, *available at* http://europa.eu.int/eur-lex/en/com/pdf/2003/com2003_0827en01.pdf (last visited Apr. 10, 2004).

> The Court will be composed of chambers of first instance and appeal. The centralised court will have exclusive jurisdiction for some actions, including litigation relating to the infringement and the validity of the patent. It will deal specifically with disputes between private parties and will also be empowered to impose sanctions and award claims for damages. Its rulings will be enforceable. Other disputes concerning Community patents such as ownership disputes will be handled by national courts. There will be a transition period for setting up the Community Patent Court until 2010 at the latest. Until such time each Member State will designate a limited number of national courts to have jurisdiction in patent disputes such as actions and claims on invalidity and infringement.

[29] IGA, *supra* note 8. Article 21 of the IGA sets the rules concerning intellectual property rights. Article 21.4 reads:

> Where a person or entity owns intellectual property which is protected in more than one European Partner State, that person or entity may not recover in more than one such State for the same act of infringement of the same rights in such intellectual property which occurs in or on an ESA-registered element. Where the same act of infringement in or on an ESA-registered element gives rise to actions by different intellectual property owners by virtue of more than one European Partner State's deeming the activity to have occurred in its territory, a court may grant a temporary stay of proceeding in a later-filed action pending the outcome of an earlier-filed action. Where more than one action is brought, satisfaction of a judgment rendered for damages in any of the actions shall bar further recovery of damages in any pending or future action for infringement based upon the same act of infringement.

recover in more than one State for the same act of infringement. Therefore, if the patent holder owns a Community Patent, in a case of infringement of his/her rights, the decision of the Court will be applicable to all European Member States. Thus, this system presents many advantages for dealing with infringement occurring in the framework of the ISS. These include the simplification of procedures and the unitary court system that will reduce the costs of proceedings; a system with a sole court that will set uniform standards; and, if the decision favours the patent owner whose rights have been infringed, he or she will receive higher damages because the infringement will be deemed to have occurred on the whole territory of the Community, not just a single State. Therefore his or her intellectual property rights will be recognised as valid in all European Member States.

F. Relationship to Other Patent Laws and Conventions

The Community Patent is not intended to change current patent law but to stand alongside the existing national and European systems. Inventors remain free to choose the type of patent that best suits their needs. The Community Patent Regulation will supplement the Munich Convention. The Community Patent will be issued by the same Office as the European Patent, the European Patent Office, specifying the territory of the Community instead of individual Member States. Once a Community Patent is granted, the Community Patent Regulation applies.

Since the Regulation seeks to create a symbiosis with the Munich Convention, it will be possible to switch from a European Patent application to a Community Patent and vice versa at any time up to the grant of either. For example, a European Patent application designating all the Member States of the Community can be converted into a Community Patent application designating the entire territory of the Community. Conversely, a Community Patent application which designates the entire territory of the Community may be converted into a European Patent designating one or more Member States of the Community (European Patent) before the grant of the patent.

The relationship between the Community Patent and national patent laws raises a similar issue since dual protection for the same territory is out of the question. Therefore, Article 54 of the Community Patent Regulation[30] prohibits simultaneous protection. It provides that in such a situation the national patent will cease to have effect as soon as the Community Patent is granted.

However, it will not be possible to convert a Community Patent into a European or national patent once it has been granted. Nor will it be possible to convert a national patent into a European Patent or a Community Patent. The Community Patent Regulation will be applicable to future patent applications.

IV. CONCLUSION

The role played by intellectual property in space activities is important in order to protect and promote results of research and development and to encourage industry to pursue creative options. A solution to fill the legal lacunae that existed in the field of space-related inventions was absolutely necessary.

Creators of space-related inventions will at last have access to appropriate legal protection of their work when the Community Patent Regulation comes into force, since they will be able to file an application for a Community-wide Patent to cover any invention created in outer space and to protect its use before the Community Intellectual Property Court. Thanks to the specific features of the Community Patent, inventors will benefit from a European system of reference, unitary and affordable. This is

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[30] Proposal, *supra* note 1, at art. 54.1, "Prohibition of simultaneous protection," determines three situations in which a national patent:

> shall be ineffective to the extent that it covers the same invention as the Community Patent, from the date on which:
>
> (a) the period for filing an opposition to the decision of the Office to grant a Community Patent has expired without any opposition being filed;
>
> (b) the opposition proceedings are concluded with a decision to maintain the Community Patent; or
>
> (c) the national patent is granted, where this date is subsequent to the date referred to in point (a) or (b), as the case may be."

the first European legal instrument applicable to inventions made in outer space. Adoption of the Regulation will revolutionise the core question of applicability of patent laws to space-related inventions, notably with regard to Article 21.4 of the IGA.[31]

[31] IGA, *supra* note 8, at art. 21.4.