

## SPACE LAW

### CLASS ACTIVITIES\*



#### Class 1: Introduction

##### Discussion questions

1. What is outer space? Where does it begin? Does it have an end?
2. What is the purpose of regulating outer space?
3. What is the role, if any, of science fiction in the space race?
4. Have there been ways in which people have benefitted from the space race? If so, how?
5. Do you see any significant future benefits from the continuation of space exploration?
6. Why go into space when we have so many problems here on Earth?
7. What is SETI? What does the SETI Institute do? Is there a protocol to deal with contact?  
Do you think that SETI is a waste of time and money? Or is it a worthwhile enterprise?
8. Discuss the following cartoons.



## Class 2: The Space Race and the Cold War

Prepare a presentation on the Space Race and the Cold War. Be creative. You can do a documentary, a time line of the space race, a fictional TV news show, or anything that shows your understanding of the Space Race and its political context. You are encouraged to use pictures, videos, and texts on the Space Race that are widely available online. Be prepared to show your presentation to the whole class.

The following questions may help you prepare your presentation. But you are free to explore any angle of the Space Race.

- 1) What was the Cold War?
- 2) What was the space race? What was the goal of the space race?
- 3) Was there a winner? If so, who won?
- 4) Was the space race a worthwhile venture? Or was it just a waste of taxpayer money in a mindless attempt to defeat the Soviet Union during the Cold War?
- 5) What is the connection between the Second World War and the Space Race? What is the origin of the Space Race?
- 6) Who was Wernher von Braun?
- 7) Who was Sergei Korolev?
- 8) What is the significance of the launch of Sputnik? What did this mean for the Soviet Union? What did it mean for the United States? What about the rest of the world?
- 9) Can you draw a parallel between the Space Race and today's global political situation?

### **Class 3: Outer Space Treaty**

#### **Scenarios**

1. The United States launches a manned space vehicle to orbit the Earth for a week. The vehicle is registered in the United States. The crew is made up of American and Canadian astronauts. While on board the space vehicle, a Canadian astronaut writes songs dealing with space exploration. When back on Earth the astronaut signs a deal with a record company to make an album with the songs. The United States objects alleging that it has the copyright over the songs. Do you agree? Why or why not?
2. Moon Real Estate Inc. is selling parcels on the Moon for \$1500 apiece. Is this legal? Why or why not?
3. The United States has authorized Boeing, a US private corporation, to provide commercial space launch services. Yemen objects arguing that article I of the Outer Space Treaty states that "outer space shall be free for exploration and use by all States without discrimination of any kind on a basis of equality and in accordance with international law."
4. The Russian Federation discovered a new planet outside the solar system. It named it Putinsky planet and claimed it for Russia. It is believed that no human activity will involve this planet for the next millennia. The Government of Canada requests your opinion as to whether it should object to Russia's claim over the newly discovered planet.
5. The new US government wants to refloat Ronald Reagan's so called Star Wars Initiative, whereby the US would deploy space objects capable of destroying missiles. Is this legal? Why or why not?
6. The Canadian government wants to send military personnel to the International Space Station to conduct scientific experiments related to the preservation of the Earth environment.

7. The French government hired the Chair of Space Technology at the University of Paris I to conduct experiments in the International Space Station. These experiments, if successful, will lead to the improvement of defence capabilities to prevent terrorist attacks such as the ones suffered in Paris on November 13, 2015.
8. The Chinese government plans to test nuclear weapons near Pluto. China has assured that the test is absolutely harmless.
9. France and the province of Quebec jointly launch a satellite to low earth orbit. The satellite contaminates part of the orbit. Who is responsible for the satellite?
10. Japan, Korea, and Israel launch a small manned space station with the capacity for only two astronauts at a time. Japan registers the space station. The first crew is made up of a Korean and Israel astronauts. Israel passes a law prohibiting the consumption of non-Kosher food on the space station. Korea objects. Is this legal? Why or why not?
11. Iran and Pakistan construct and launch a small manned space station with the capacity for three astronauts at a time. Iran registers the space station. Iran and Pakistan enter into a bilateral agreement whereby they agree that only male astronauts can use the space station. They both pass domestic laws prohibiting female astronauts from using the space station. The Canadian Space Agency wants to rent the use of a laboratory on the space station. It wants to send a female astronaut. Both Iran and Pakistan agree to let Canada rent the laboratory, but warn the Canadian government that only male astronauts can go to the space station.
12. India has launched a manned space vehicle to outer space. After navigating for 48 hours the vehicle malfunctions and the Indian astronauts make an emergency landing in the US portion of the St. Mary's river in Sault Sainte Marie, Michigan. The Indian astronauts are arrested for entering the United States illegally. India demands the immediate return of the astronauts to India.
13. Canada has purchased a telecommunications satellite from Boeing, a US corporation. Canada wants to use the satellite to provide television and internet services to remote areas in the Canadian North. The satellite is launched by Arianespace, a French corporation, from the French Guyana. What country has jurisdiction and control over the satellite?
14. The Sault Satellite Co., a start-up company made by Algoma University students, has constructed a small satellite to provide accurate weather data in the Algoma region. The Sault Satellite Co. successfully launches the satellite from a small base that students themselves built in Elliot Lake. Students contact the Sault Star, which reports the story in its front page and prominently on its website. The story goes viral. The Canadian government summons the students for grave violations to Space Law. Suppose you work for the government. What legal provisions, if any, have the students violated?
15. Russia launches a manned space vehicle to orbit the Earth for a week. The crew is made up of two Russian cosmonauts (one of whom is the captain) and a Canadian astronaut from Sault Ste. Marie –a current Algoma University student. The space vehicle is

registered in Russia. The Canadian astronaut takes a memento from the Russian captain to keep it as his personal souvenir. Who has jurisdiction over this crime?

### Class 4: Space Liability Convention

Read the articles published in the Sault Star and discuss the following questions.

- What is the problem described in the article? Is this a very remote damage? Or is it probable?
- From a legal perspective, who can file a claim in the event of damage?
- Who should the claim be addressed to?
- What are the challenges of that claim?
- What compensation, if any, could be awarded in the event of damages caused to property in the Sault?



What you gon' do with all that junk?

MARC CAPANCIONI, SPECIAL TO THE STAR

Monday, February 23, 2009 6:10:00 EST AM

With the recent collision of two satellites, what are the chances of space junk falling on the Algoma District? How safe are you, your family and your property from damages caused by plummeting debris? Earlier this month, two satellites -- one American, the other Russian -- struck each other while orbiting the planet above Siberia. The impact smashed both devices into smithereens, creating a cloud of space junk with hundreds of fragments. Many of these pieces could fall to Earth. Last week, an amateur videographer might have recorded one of the fragments plummeting in Texas. The scene shows a fireball racing to the ground. Are houses and cottages in the Algoma District safe? Should residents be running for cover? Assuming the debris isn't prone to strike one particular area of the planet, here's how the probability breaks down: Water covers roughly 70 per cent of the 510 million square kilometres of Earth, meaning there's only a 30 per cent chance that a piece of debris hits land at all. At nearly 10 million square kilometres, Canada consists of roughly two per cent of the Earth's surface, making a 1-in-50 shot of getting hit. However, almost nine per cent of the country is covered with water, making it

even less likely of an impact on Canadian soil.

The Algoma District, which is about 48,700 square kilometres square, makes up only about one-half-of-one per cent of the surface of Canada. If space junk happens to fall on Canada, there's about a one-in-200 shot that it hits Algoma. Since much of the district is forest, residents should be in the clear even with a direct strike on the region. Statistics Canada lists 58,742 private dwellings in the Algoma District.

The chances of a piece of debris hitting one of these building: slim to none. The chances of it hitting your building: much, much less. If your house is struck with space junk, here's what you should know: Damages caused by plummeting debris is included in a standard homeowners' insurance policy. "Falling debris is covered," said Ron Lamon, a registered insurance broker with Bruce Mines Insurance. Tree limbs and airplane parts are more common, but space junk "also qualifies," he said. If property is damaged, the insurance company fits the bill once the deductible is paid.

The chances of a piece of space junk hitting a person in the Algoma District: astronomical. The chances of it hitting you: mind-blowingly astronomical. These probabilities are for one piece of falling debris. As the number of pieces rises, so does the chances of hitting a particular area. However, officials are hopeful that much of the debris will burn up in the Earth's atmosphere prior to colliding with the surface.

But what happens if there are injuries, death or other trauma caused by space junk? What if it causes heartache and stress? Can anyone be sued for the mishap? Well, it just so happens that there is an international treaty that deals with this type of rare situation. In 1972, when satellites were being rocketed into space on a somewhat regular basis, countries around the world signed the Convention on International Liability for Damage Caused by Space Objects. The convention outlines the remedy procedure for incidences involving destruction by falling space junk.

Julian Hermida, a professor of law and justice at Algoma University, has been studying this and other space-related legislation for years. "The convention imposes liability to the state, even if the space object that caused the debris was launched by a private entity," said Hermida, author of the books *Legal Basis for a National Space Legislation and Commercial Space Law*. "Similarly, in case of a dispute, it is the state -- not the actual victim -- that may make a claim to the other state." Although a treaty is in place, damage caused by falling space debris is so rare that the convention has yet to be invoked. However, in 1978, when a Soviet nuclear-powered surveillance satellite crashed into the Northwest Territories, a claim was nearly made under the convention. Radioactive waste spread across 124,000 square kilometres in northern Canada. But instead of invoking the treaty, a settlement was reached whereby the Kremlin agreed to pay damages but did not recognize responsibility. With the recent satellite collision, the Space Liability Convention could be invoked for the first time if falling debris happens to cause destruction or death.

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## One man's junk . . .

Marc Capancioni

Monday, March 16, 2009 7:02:00 EDT PM

Special to the Star

ALGOMA - If space junk causes damage to your house, cottage or loved one, there is a reparations process. But who shoulders the cost? A few weeks ago, The Sault Star ran a story on the recent collision of two satellites and the likelihood of a piece of space junk falling on the Algoma District. The second part to this series will look at some of the legal ramifications for damages caused by space debris. Statistics Canada lists a population of 117,461 in the district and a population density of only 2.4 people per square kilometre. Needless to say, the chances of space junk hitting a person or building in the Algoma District are astronomical. However, if damage is caused to your house, cottage or loved one, there is a reparations process. In 1972, countries around the world signed the Convention on International Liability for Damages Caused by Space Objects.

Essentially, if space junk causes damage to property or a person in a country, the government of that country - not the actual person with a grievance - files a complaint to the state that the debris came from. Even if the satellite is from a private company, the state is liable for damages caused by it. But how easy is it to get a country to pay damages? For answers, The Sault Star spoke with Julian Hermida, a professor of law and politics at Algoma University. "That's one of the problems. If (a country) doesn't comply, there's very little that other states can do," he said. "That's the problem with international law in any area." In the recent collision, one satellite was from Russia while the other came from a private company in the U.S. Regardless of who's to blame, both countries would be equally liable for damages caused on Earth, said Hermida, who specializes in space legislation. If a piece of space junk causes damages in the Algoma District,, the Canadian government could file a complaint against the U.S., Russia or both, and it wouldn't matter which satellite the plummeting piece came from. If Moscow was picked and a settlement not reached, a claims commission would be set up consisting of one arbitrator picked by Canada, one by Russia and a third mutually agreed on by both, said Hermida. Such a commission has yet to be established in the more than 35 years since the Liability Convention was signed. As for damages caused to the satellites themselves, the U.S. and Russia each has an argument that the other is to blame for the collision to begin with.

After all, the American satellite was supposed to have at least some internal ability to avoid other

space objects. On the other hand, the Russian satellite was out of use, and the country has had no way to control its trajectory for more than a decade. Simply put, both states could make a case and seek damages from the other. However, Hermida said a fight for compensation is unlikely. The two nations are partners in space, and bickering over a situation like this would be counter-productive. "I don't think it would make sense," he said. "They have too much at stake." Also, proving which satellite -and, thus, which country - was to blame would be very difficult.

"Fault has never been defined in the special context of such in-orbit collisions," said Frans von der Dunk, a professor of space law at University of Nebraska-Lincoln, which has one of few space and telecommunications law programs in the world. Clarification is needed before progress can be made, he added. "I think we (first have to) develop a further understanding of what fault is supposed to mean." This is especially important as more and more space objects are being sent into orbit, meaning another collision is "almost certain to re-occur sooner or later," said van der Dunk.

## Cosmos 954

### The COSMOS 954 Accident

On 24 January 1978, COSMOS 954, a Soviet nuclear-powered surveillance satellite, crashed in the Northwest Territories. The crash scattered a large amount of radioactivity over a 124,000 square kilometre area in Canada's north, stretching southward from Great Slave Lake into northern Alberta and Saskatchewan.

#### Aftermath

The clean-up operation was a coordinated event between the United States and Canada. Dubbed "Operation Morning Light", the clean-up effort continued into October 1978 and resulted, according to the Atomic Energy Control Board (now the [Canadian Nuclear Safety Commission](#)), in the estimated recovery of about 0.1 percent of COSMOS 954's power source.

Using special radiation sensors, Canadian and American teams flew over the contaminated area trying to detect parts of the power source on the ground's surface. In addition, decontamination teams worked on foot to locate radioactive bits of the downed satellite and to package and remove them in specially shielded canisters.

#### Lessons Learned

The experience of COSMOS 954 stimulated the awareness in Canada that a federal nuclear emergency preparedness and response plan was needed. The [Three Mile Island](#) incident a year later reinforced this need, and convinced officials that the time had come to set up a contingency plan to deal with peacetime nuclear accidents and events.

#### Positive Outcomes

The crash of COSMOS 954 raised international policy questions. Soon after the satellite's crash,

there was a call from the United States to prohibit satellites containing radioactive material from orbiting the earth. This was followed by similar calls from Canada and countries in Europe. In November 1978, the United Nations authorised its Committee on the Peaceful Uses of Outer Space to set up a working group to study nuclear-powered satellites.

Source: [http://www.hc-sc.gc.ca/hc-ps/ed-ud/fedplan/cosmos\\_954-eng.php](http://www.hc-sc.gc.ca/hc-ps/ed-ud/fedplan/cosmos_954-eng.php)

## Scenarios



1. Canada hired Airanspace, a French space launch provider, to launch a small telecommunications satellite to low earth orbit from its Guyana territory. The Arianespace vehicle exploded seconds after the launch. Debris from the explosion hit an Alitalia airplane and killed all 200 passengers and crew.
2. Canada hired Airanspace, a French space launch provider, to launch a small telecommunications satellite to low earth orbit from its Guyana territory. The Arianespace vehicle exploded seconds after the launch. Debris from the explosion hit a Japanese fishing boat and killed the Japanese captain and his crew.
3. Bell Canada hired a Russian space launch carrier to launch a telecommunications satellite to geostationary orbit. The launch took place from Baykonour, a space launch facility in Kazakhstan. The space vehicle crashed into a low earth orbit Spanish satellite, rendering it completely inoperative.
4. Bell Canada hired a Russian space launch carrier to launch a telecommunications satellite to geostationary orbit. The launch took place from Baykonour, a space launch facility in Kazakhstan. The space vehicle exploded and killed 5 Russian citizens working for the space launch facility.
5. Bell Canada hired a Russian space launch carrier to launch a telecommunications satellite to geostationary orbit. The launch took place from Baykonour, a space launch facility in Kazakhstan. The space vehicle exploded and killed the Canadian Space Agency president, who had travelled to Baykonour to observe the launch.

6. A US private launch carrier placed a Brazilian satellite in outer space. The launch carrier negligently crashed into a Russian space station, killing all cosmonauts on board.
7. A US private launch carrier placed a Brazilian satellite in outer space. Debris from the launch killed Canadian and French journalists covering the launch.
8. A Russian satellite hits an American satellite, and they both destroy a Canadian satellite in orbit.
9. An old Russian satellite falls on Sault Ste. Marie, killing Alex, a 46-year old father of two daughters aged 12 and 15. Alex worked at Tenaris and earned \$100,000 a year.
10. A Canadian company manufactured a space vehicle. The vehicle was launched from the United States. It malfunctioned and killed 3 Mexican citizens illegally residing in the US. Canada and the US entered into an agreement whereby the US would be solely liable for damages arising from the launch. The Mexican government demands compensation from the Canadian government.

### **Class 5: The International Space Station**



Do online research and make a short presentation on the assigned topic dealing with an aspect of life in space, particularly on the International Space Station. Explain the challenges of the assigned topic. Find a video and news article. If possible, find a popular culture work dealing with the assigned topic.

- Eating and food
- Health
- Astronaut training and skills
- Entertainment
- Spacewalks
- Sleeping

- Personal hygiene (going to the bathroom, dental care, shaving)
- Scientific experiments



We've all gotten calls from people who have misdialed, drunk-dialed or butt-dialed, but not many of us can say we've accidentally gotten a call from an astronaut trying to make contact from the International Space Station.

British European Space Agency astronaut Tim Peake accidentally dialed the wrong number while making an in-flight outgoing call from the ISS on Christmas Eve but ended up reaching a stranger who probably thought the whole incident was an elaborate prank. Peake shared the happening on Twitter, tweeting "I'd like to apologise to the lady I just called by mistake."

As NASA Flight Director Holly Ridings has explained, ISS astronauts can phone home whenever they want. "They actually have an IP phone, which works functionally through a computer" "It's kind of like 'Space Skype.' They can call any phone in the world if they have the right satellite coverage."

We can only imagine what it was like for someone to get a call from Peake from the ISS. But we now know to respond if someone phones us with the message "Is this planet Earth?" We'll say "yes!"

## Sex in space



- Is sex possible in outer space? Is physical intimacy possible?
- Is the impossibility of having traditional/conventional sex a problem for long term missions in outer space? Why or why not?
- What is Newton's 3<sup>rd</sup> law?
- Why haven't NASA and the Russian Space Agency conducted experiments on sex in space?
- What is Vanna Bonta's 2Suit?
- What is the Viagra effect?
- What is the law about sexual relations in space?
- What are the physiological problems of long-term space missions? How do these problems affect reproduction?
- Is reproduction in space possible? Why or why not?
- What can be done to enable human reproduction in space? What steps have been taken to facilitate human reproduction?
- What are some of the psychological problems that may arise from sexual relations in space?
- Why have space agencies insisted on a model that sublimates their needs and desire for the sake of a space mission?
- What is Sheryl Bishop's suggestion? What do you think of this suggestion?

## **Class 6: Crimes in Space**

**Lisa Nowak**



- 1) Why did Lisa Nowak stalk Colleen Shipman?
- 2) Has her space mission affected her behaviour? If so, how?
- 3) What happens when men and women live together in close proximity and under intense conditions for long stretches of time? Should workplaces/the government regulate employees' relationships?
- 4) Have you ever been crazy in love, feeling that you cannot be without the object of your affection? Have you ever done anything "crazy"? If so, what was your "Lisa Nowak" moment? Did you go to crazy lengths for something you wanted really bad (other than a loved one)? Should the law regulate these incidents? Why or why not?
- 5) Do an online search of the effect of this incident on NASA? What did NASA do as a consequence this incident?
- 6) Read online about astronauts and alcohol, including (NASA's Safe Flight Safety Review: Alcohol Use in the Preflight Period). Discuss astronauts' use of alcohol before space missions. Discuss the Shuttle and Soyuz incidents.

### **Scenarios**

- 1) A Canadian astronaut intentionally hits a Russian astronaut in a Russian segment on the International Space Station.
- 2) A Canadian astronaut negligently hits a Russian astronaut in a Russian segment on the International Space Station.

- 3) An American male astronaut sexually touches a Canadian female astronaut without her consent.
- 4) An American male astronaut sexually touches a Canadian female astronaut with her consent.
- 5) An American male astronaut sexually touches a Canadian female astronaut with her consent in an American segment on the International Space Station. A Spanish female astronaut on board the International Space Station feels uncomfortable and informs mission control that there is a hostile environment (sexual harassment).
- 6) The American –male- commander tells a Canadian female astronaut that she can be exempted from duties on the ISS if she agrees to date him when they return to Earth. The Canadian astronaut reports this to the Canadian Space Agency.
- 7) A Canadian astronaut steals a French astronaut’s laptop valued \$3000 CAD in the French element on the ISS.
- 8) A Canadian astronaut is intoxicated and engages in disorderly conduct in the Russian element.
- 9) A Canadian astronaut kills a British astronaut in the American element on the ISS.
- 10) A Canadian astronaut intentionally destroys American equipment in the US element of the ISS.



## **Class 7: Review**

## **Class 8:**

## **Midterm**

## **Class 9: Intellectual Property and Space**



### **Treatment**

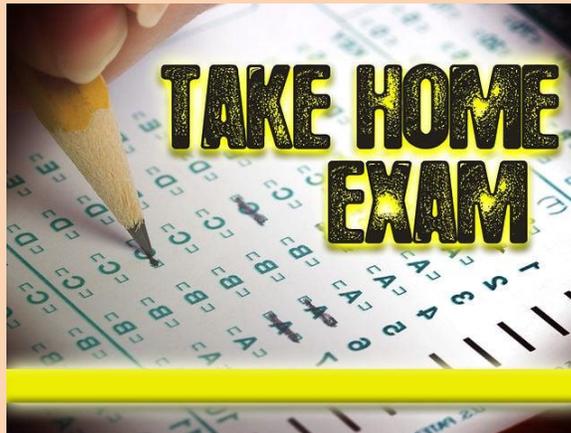
- You have been hired to write a new episode of Law and Order dealing with crimes in space. Write the treatment for the episode. Be specific. Write at least a full paragraph for each sequence (group of scenes). Plan, at least, 10 sequences.
- The plot must include several legal issues, including the commission of, at least, one crime. It must also include the creation of intellectual property in space or the illegal use of intellectual property in space.
- Think of the leading cast.

## **Class 10: National Space Legislation**

Do a web search and summarize and analyze the national space legislation of the assigned jurisdiction. Prepare a short presentation to explain the central aspects of the law.

- 1) United States
- 2) France
- 3) Australia
- 4) Russian Federation
- 5) United Kingdom
- 6) Argentina
- 7) Canada
- 8) Brazil
- 9) Japan

### **Class 11: Distribution of final take-home**



### **Class 12: Submission of final take-home**



**\* TRIGGER WARNINGS**

Some materials in this course may be sensitive. Course materials, including lectures, class activities, hypotheticals, scenarios, examples, court cases, and films shown in class, may have mature content, including violent, sexual, and strong language content. Except for newspaper articles and court cases, all class activities are hypothetical and fictitious. Any resemblance to actual persons, institutions, or events is purely coincidental. The views and opinions expressed in the articles assigned for reading in this course are those of the authors and do not necessarily reflect the position of the course professor. Questions, follow-up questions, examples, and comments made within the context of class activities do not purport to reflect the opinions or views of the course professor. All such articles, comments, questions, examples, and activities are meant solely to facilitate the discussion and study of Law. They are not meant to advocate or promote any crime or unlawful action. Neither are they meant to advance any ideological perspective. Discretion advised before signing up for this course.