

Your Daily Dose of Fiber (Bundles)

GSAW Research Symposium

Isaac M. Craig

3 April 2018

Bryn Mawr College

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

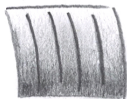
The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

For example: if X is a line and Y is a line then $X \times Y$ is a:

Products

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

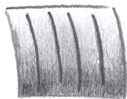
For example: if X is a line and Y is a line then $X \times Y$ is a:



Products

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

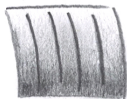
For example: if X is a line and Y is a circle then $X \times Y$ is a:



Products

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

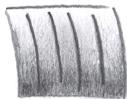
For example: if X is a line and Y is a circle then $X \times Y$ is a:



Products

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

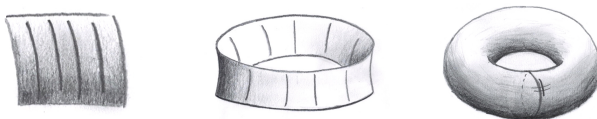
For example: if X is a circle and Y is a circle then $X \times Y$ is a:



Products

The **product** of two spaces X and Y is a space $X \times Y$ formed by uniformly attaching to each point in X a copy of Y .

For example: if X is a circle and Y is a circle then $X \times Y$ is a:



A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

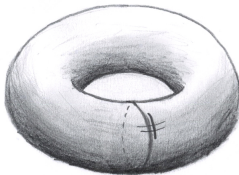
- any product (square, cylinder, torus)

Fiber Bundles

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)

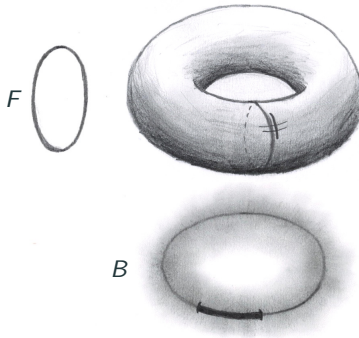


Fiber Bundles

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)

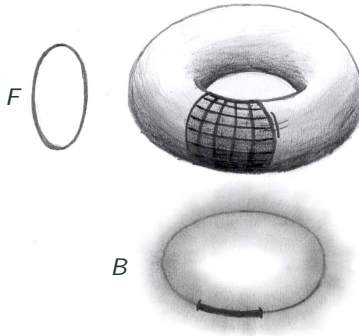


Fiber Bundles

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

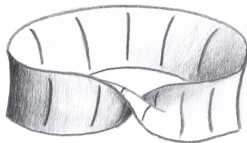
- any product (square, cylinder, torus)



A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)
- the Möbius band (twisted cylinder)

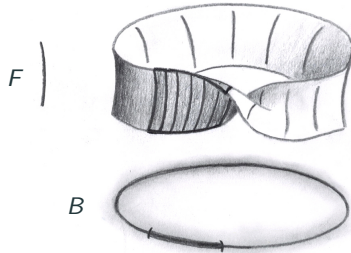


Fiber Bundles

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)
- the Möbius band (twisted cylinder)



A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

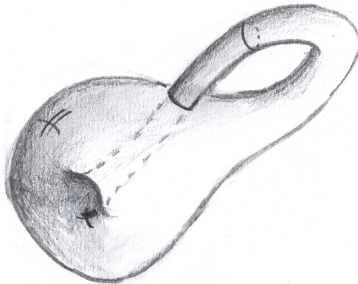
- any product (square, cylinder, torus)
- the Möbius band (twisted cylinder)
- the Klein bottle (twisted torus)

Fiber Bundles

A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)
- the Möbius band (twisted cylinder)
- the Klein bottle (twisted torus)



A **fiber bundle** is a **local product** of two spaces B and F , called the **base space** and **fiber space**, respectively.

For example:

- any product (square, cylinder, torus)
- the Möbius band (twisted cylinder)
- the Klein bottle (twisted torus)
- higher dimensions...?

Fiber Bundles

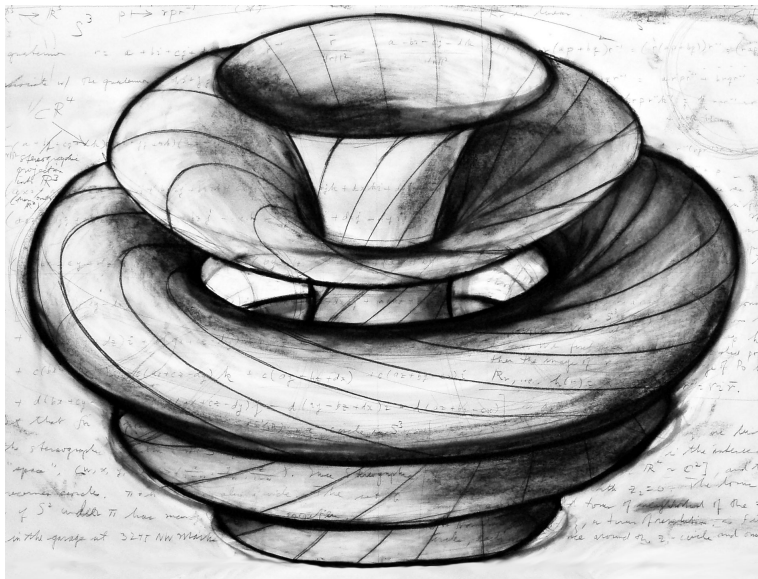


Photo cred: Lun-Yi Tsai

Thank you!