

# Geobiology 2017 Conference Guide



## Table of Contents

<b>Welcome.....</b>	<b>2</b>
<b>General Information.....</b>	<b>2</b>
<b>Conference Schedule.....</b>	<b>3</b>
<b>Map of the Banff Centre.....</b>	<b>7</b>
<b>Map of Banff.....</b>	<b>8</b>
<b>Organized Field Trips.....</b>	<b>9</b>
<b>Social Activities.....</b>	<b>10</b>
<b>Historic and Tourist Sites.....</b>	<b>10</b>
<b>Hiking.....</b>	<b>11</b>
<b>Gear Rentals.....</b>	<b>11</b>
<b>Restaurants.....</b>	<b>12</b>
<b>Shopping.....</b>	<b>14</b>
<b>Amenities and Attractions.....</b>	<b>14</b>
<b>Hotels and Campgrounds.....</b>	<b>15</b>
<b>Rental Cars.....</b>	<b>16</b>

## Welcome

Thank you for joining us in Banff, Alberta for Geobiology 2017 – the 1<sup>st</sup> Geobiology Society Conference! Banff provides us with a world-class, and picturesque venue for the meeting. The conference is being held at the Banff Centre for the Arts, situated on the side of Tunnel Mountain, overlooking the Bow Valley.

At this innovative conference emphasis is placed on the work of early career scientists, with talks each morning delivered by senior post-doctoral researchers or junior faculty members. Each afternoon, students and post-docs are presenting posters on material associated with the theme of the day.

One of the advantages of hosting Geobiology 2017 in Banff, is that it is a tremendous venue for those who wish to bring their families! Surrounded by the beautiful Canadian Rocky Mountains there are many opportunities for hiking, biking, outdoor adventures, and even shopping or relaxing. Banff is a welcoming town, with a tremendous reputation for year-round adventure. As an added bonus, Canada is celebrating its 150<sup>th</sup> birthday in 2017, and admission to the national parks is free all year (passes can be ordered online or picked up at the park gate) – making this the perfect opportunity to bring your family and explore Banff or any of the other National Parks in the Canadian Rockies!

Thanks for making the trip out, and welcome!

## General Information

General information on the conference, the Banff Centre for the Arts, Banff and other national parks nearby can be found at the following websites:

Geobiology 2017:

<http://cms.eas.ualberta.ca/Geobiology2017/>

Link to Pre-order your **Free Parks Canada Pass**

<http://www.commandesparcs-parksorders.ca/>

The Banff Centre for the Arts:

<https://www.banffcentre.ca>

Banff Tourism:

<https://www.banfflakelouise.com>

or

<https://www.travelalberta.com/ca/places-to-go/canadian-rockies/banff/>

Banff National Park

<http://www.pc.gc.ca/eng/pn-np/ab/banff/index.aspx>

Yoho National Park

<http://www.pc.gc.ca/eng/pn-np/bc/yoho/index.aspx>

Jasper National Park

<http://www.pc.gc.ca/eng/pn-np/ab/jasper/index.aspx>

Kootenay National Park

<http://www.pc.gc.ca/eng/pn-np/bc/kootenay/index.aspx>

## Conference Schedule

	<b>Sunday June 11</b>	<b>Monday June 12</b>	<b>Tuesday June 13</b>	<b>Wednesday June 14</b>
8:45		Introductory words		
9:00		<b>THEME 1 - Metabolic Imprints on Surface Ecosystems</b>	<b>THEME 3 - Geobiology at Interfaces</b>	<b>THEME 6 - Precambrian Redox Evolution</b>
		Talk 1 - Jennifer Glass (Georgia Institute of Technology)  <i>Ironing out the impact of mineral-microbe interactions on ancient atmospheres</i>	Talk 1 - Dan Alessi (University of Alberta)  <i>Reactivity at biomineral surfaces: Processes and modelling</i>	Talk 1 - Kimberly Myers (Lamont- Doherty/Texas A&M)  <i>Arsenic(V) in 3,260- million-year-old cherts record a photosynthesis-driven arsenic cycle</i>
		Talk 2 - Karen Lloyd (University of Tennessee)  <i>Geochemical evidence</i>	Talk 2 - Cara Santelli (University of Minnesota)  <i>Metal(loid) redox transformations and biomineralization by</i>	Talk 2 - Eva Stüeken (University of St. Andrews)  <i>Antiquity and</i>

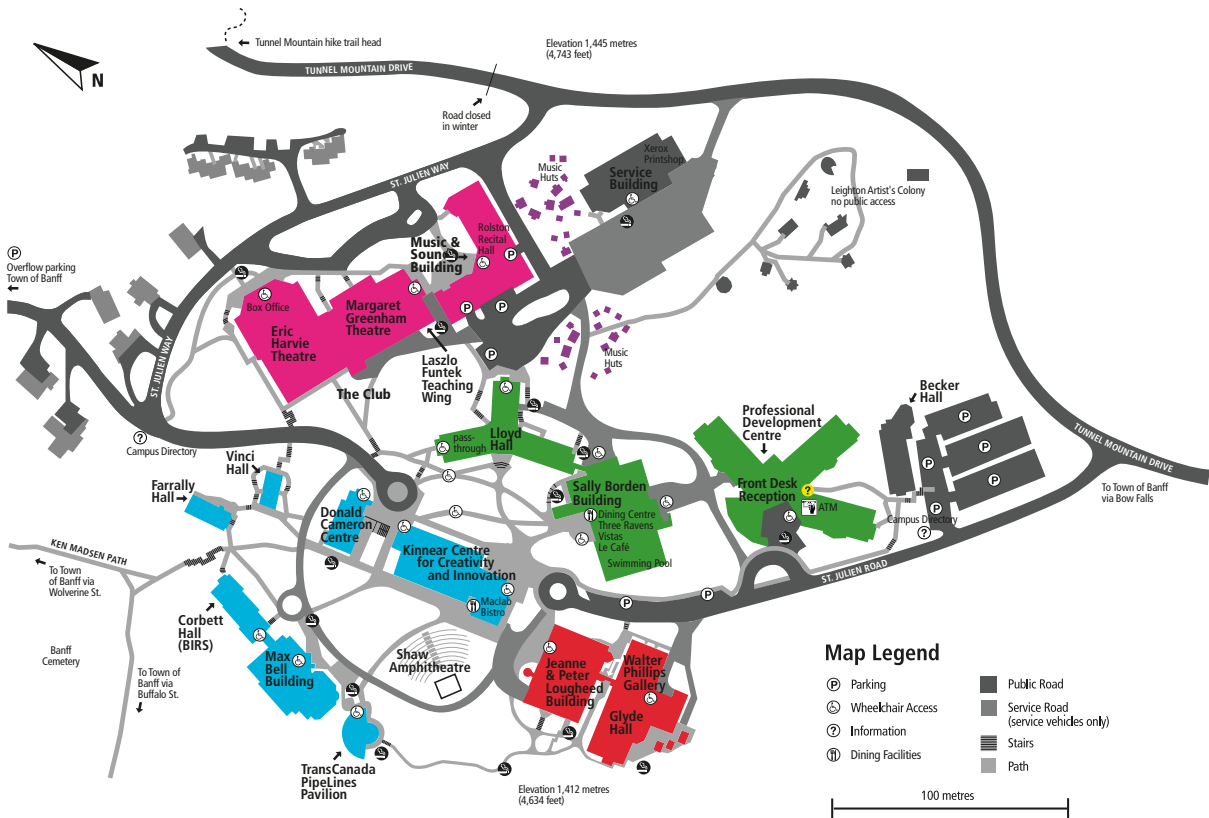
		<i>for genomic predictions in uncultured archaea and bacteria</i>	<i>fungi</i>	<i>implications of microbial nitrogen metabolisms: A geochemical perspective</i>
		Talk 3 - Douglas LaRowe (University of Southern California)  <i>Marine sediments as microbial habitats on a global scale</i>	Talk 3 - Julia Perdrial (University of Vermont) <i>Carbon dynamics from a Critical Zone perspective: Impact of molecular scale organic-inorganic interactions on the catchment scale</i>	Talk 3 - Stefan Lalonde (University of Brest)  <i>Trace elements and evolution of the Archean biosphere</i>
11:00		<b>THEME 2 - Modern Microbes as Portals to Ancient Worlds</b>	<b>THEME 4 - Depositional Environments</b>	<b>THEME 7 - Evolution and Mass Extinctions of Animals</b>
		Talk 4 - Betul Kacar (Harvard University) <i>Reconstructive evolution of Precambrian carbon fixation proteins</i>	Talk 4 - Emmy Smith (Johns Hopkins University) <i>The Precambrian-Cambrian boundary in the Southwest USA</i>	Talk 4 - Lidya Tarhan (Yale University)  <i>Development of bioturbation and implications for early Palaeozoic biogeochemical cycling</i>
		Talk 5 - Mirna Daye (Massachusetts Institute of	Talk 5 - Jon Husson (University of Victoria) <i>From basin to crystal:</i>	Talk 5 - Kathleen Ritterbush (University

		Technology) <i>Light driven anaerobic oxidation of manganese in cultures an oxygenic photosynthetic microbes</i>	<i>Constraining the origin of Earth's largest carbon isotope excursion</i>	of Utah) <i>Successful slackers in ancient oceans</i>
		Talk 6 - Xinning Zhang (Princeton University) <i>Isotopic insights of nitrogen fixation in the lab and field</i>	Talk 6 - Clara Blättler (Princeton University) <i>Tests for diagenesis and carbonate chemistry in ancient carbonate rocks</i>	Talk 6 - Katja Meyer (Willamette University) <i>The influence of the biological pump on marine redox conditions</i>
12:30		lunch	lunch	lunch
1:30		breakout session from morning talks	breakout session from morning talks	breakout session from morning talks
2:00		student posters	<b>THEME 5 - Precambrian Oxygenation</b>	student posters
			Talk 7 - Greg Fournier (Massachusetts Institute of Technology) <i>Dating the origin and diversification of</i>	

			<i>cyanobacteria</i>	
			Talk 8 - James Hemp (California Institute of Technology) <i>New constraints on the evolution of oxygenic photosynthesis</i>	
			Talk 9 - Tom Laakso (Harvard University) <i>Oxygen dynamics during global glaciation</i>	
			Talk 10 - Michael Babechuk (Memorial University of Nfld) <i>New evidence for anoxic weathering at ca. 2.45 Ga from the Cooper Lake paleosol</i>	
5:00	welcome icebreaker	T.J. Beveridge Award talk	Point-counterpoint talk	R.M. Garrels Award talk
		Sara Pruss (Smith College)	<i>Is animal evolution tied to oxygenation?</i> Erik Sperling (Stanford University)  Chris Reinhard (Georgia Institute of	Lee Kump (Pennsylvania State University)

			Technology)	
			Daniel Mills (University of Southern Denmark)	
7:00	BBQ on site	dinner/drinks in Banff	dinner/drinks in Banff	dinner/drinks in Banff

## Map of the Banff Centre





# Map of Banff



## Organized Field Trips

### **1. Pre-conference (Mt. Stephen Fossil Beds) – 60 spots maximum (FULL):**

Made famous by the early exploration and collection of fossils by Charles Doolittle Walcott, the Walcott quarry sits on the shoulder of Mt. Walcott in Yoho National Park. Across the valley from the Burgess Shale, lies the Mt. Stephen fossil beds - an excellent collection of Cambrian trace and body fossils, most notable for its well-preserved trilobites. Neither of these localities are accessible without escort by a licensed guide, as they are protected UNESCO world heritage sites. A field trip has been arranged with Parks Canada to the Mt. Stephen Fossil Beds (~\$85 CAD/person – payment details forthcoming) for Sunday June 11<sup>th</sup>, before the conference begins. Due to group size restrictions allowed at the sites, we are only able to offer 50-60 spots. For those interested in attending please email [geobiology2017@gmail.com](mailto:geobiology2017@gmail.com) as soon as possible, and depending on interest we may have to utilize a draw if necessary.

This field trip will **depart early in the morning from the meeting place in Banff (TBD)** to meet the guides from Parks Canada at the visitor center in Yoho National Park, and will return to Banff in the early evening. For those with confirmed slots, please arrive in Banff on or before Saturday June 10<sup>th</sup>, 2017.

**Note:** Trail conditions (i.e., rocks, ice, and mud) may be in early season conditions, and conditions can change quickly in the mountains. Please come prepared if you are attending the field trip or are planning on doing any hiking before or after the conference. For more information on the Burgess Shale and Mt. Stephen Fossil Bed Hikes see: <http://www.pc.gc.ca/eng/pn-np/bc/yoho/activ/burgess.aspx>

### **2. Post-conference (Stanley Glacier) – number of spots TBD:**

The Stanley Glacier hike is located just across the British Columbia border in the adjacent Kootenay National Park. The trail head is a short (~45 km or ~30 minute) drive from the Banff Centre. The trail is a popular half-day to day hike that begins with an easy walk through a regenerating forest, before kicking up to the base of Mount Stanley. Along the way there are glacial features including moraines, cliffs, and an excellent view of Stanley Glacier. The trail covers about 8.4 km and has an elevation gain of ~365 m. This is also an excellent spot to look for fossils that come from an equivalent unit to the Burgess Shale, several of which can be found at the base of Mount Stanley. This is the only locality in the national parks where access to the Burgess Shale or its equivalents is not restricted.

**NOTE: It is illegal to collect fossils within the province of Alberta, or the national parks, and penalties can range from fines up to \$50,000 or a year in prison.**

## Social Activities

We have arranged several social activities for the evenings. Each night, beginning around 7-7:30 pm, we have suggested a bar in town, where the conference organizers encourage attendees to come, unwind, and mingle. Feel free to join us for a few drinks and engage colleagues in a less formal setting. Space can sometimes be limited in these bars, so arrive early to grab a table.

Sunday night: Welcome BBQ at the Banff Centre at 7:30 pm

Monday night: Bowling and Beers at High Rollers (110 Banff Ave)

Tuesday night: Wild Bill's Legendary Saloon (201 Banff Ave)

Wednesday night: Banff Ave Brewing co (110 Banff Ave, Upper Level)

## Historic and Tourist Sites

1. Cave and Basin: the birth place of the Canadian National Parks, and the original hot spring pool in Banff.
2. Banff Upper Hot Springs: the upper hot springs have a pool where you can relax and soak in the hot springs, or book into the spa.
3. Banff Park Museum: a museum on the south end of Banff Ave with exhibitions on the animals, and minerals of the National Parks.
4. Whyte Museum: located on Bear Street this museum is dedicated to the culture of the Rocky Mountains.
5. Lower Bankhead: located along the Lake Minnewanka Scenic Drive, Bankhead is an old coal mining town. Long gone, but not forgotten, the lower Bankhead site still has the foundations of the old town. Take a self-guided walk through the foundations and learn some of Banff's history.
6. Banff Springs Hotel: one of Banff's most-luxurious and oldest hotels, the Banff Springs is a member of the Fairmont Chain. With a golf-course, shopping, and dining on site, this castle-like hotel is an icon of the Rockies.
7. Cascade Gardens: located on the south end of Banff Ave, just across the bridge, these gardens surround the National Parks administration building. A great place for an afternoon stroll.
8. Sulphur Mountain Gondola: the gondola base is located near the upper hot springs, whisks visitors to the top of Sulphur Mountain where there are several viewpoints, and a restaurant at the upper terminal. The upper gondola base can also be accessed by a moderate to difficult hiking trail, and hikers have historically could ride the gondola down for a reduced rate.
9. Mt. Norquay: the closest ski hill to the town of Banff, the hill is accessed by a switch-backing road. In the summer this road offers tremendous views of the Bow Valley, and the Mt. Norquay ski hill offers a base for hiking, and a guided via ferrata.

## Hiking

Prime hiking season in Banff, Yoho, and Kootney National Parks is generally from early July until mid-September. Although in June trails in the valley bottoms may be in excellent condition, alpine trails may be subject to early season conditions. Early season conditions may increase the difficulty of hikes or make trails impassible and can include: snow (and associated avalanche risks), snow melt, mud, and/or recent trail obstructions. Come prepared for potential early season conditions, as well as temperatures that can fluctuate between from near freezing to upwards of 20°C during the day varying with elevation.

Banff and Lake Louise have numerous phenomenal hikes, some of which can be accessed directly from town or by a short drive. For trail information and conditions in and around Banff and Lake Louise see:

Banff: <http://www.pc.gc.ca/eng/pn-np/ab/banff/activ/randonee-hiking/banff.aspx>

Lake Louise: <http://www.pc.gc.ca/eng/pn-np/ab/banff/activ/randonee-hiking/lakelouise.aspx>

Trail Conditions: [http://www.pc.gc.ca/apps/tcond/cond\\_e.asp?oPark=100092](http://www.pc.gc.ca/apps/tcond/cond_e.asp?oPark=100092)

## Gear Rentals

### **In Banff:**

#### **Bactrax Banff Camping Rentals**

Rents: Camping gear, backpacking gear, bikes

225 Bear Street

403-762-8177

<http://www.campingbanff.com/car-camping-rentals-in-banff/>

#### **Banff Adventures**

Rents: Bikes

211 Bear Street

1-800-644-8888

<http://www.banffadventures.com/Things-To-Do/Summer-Activities>

#### **The Banff Canoe Club**

Rents: Canoes, kayaks

Corner of Wolf Street and Bow Ave

403-762-5005

<http://banffcanoecub.com>

### **Banff Cycle**

Delivers and picks up bikes

403-985-4848

<http://banffcycle.com>

### **Ultimate Sports Banff**

Rents: Bikes

206 Banff Ave

403-762-0547

<http://ultimatebanff.com>

### **Outside Banff:**

#### **Mountain Equipment Co-op (Calgary)**

Rents: some camping and hiking gear; kayaks, canoes, and stand-up paddle boards.

830 – 10<sup>th</sup> Ave SW, Calgary, Alberta

403-269-2420

<https://www.mec.ca/en/stores/calgary>

Gear Up Mountain Sport and Rentals

1302 Bow Valley Trail, Canmore, Alberta

403-678-1636

<https://www.gearupsport.com/summer-rentals>

## Restaurants

Banff is home to a great number of restaurants, cafés, and bars. Each day coffee and lunch will be provided, and social activities have been arranged for each evening (see above or talk to the director of social events: Tyler Warchola). However, if you are looking for a place for dinner, or will be in Banff for a few days on either side of the conference, see a brief list below that highlights some of Banff's many options. Please note, hours listed are the most general and may vary slightly by day.

**\*\*Note: Banff can be quite busy year round, if headed out with a large group, we recommend trying to secure a reservation (if possible).\*\***

### **On-site:**

#### **Three Ravens Restaurant & Wine Bar**

Bar open daily 4 pm to midnight, and for dinner 5-9 pm

403-762-6300

**Maclab Bistro**

Open daily from 7am to midnight (breakfast, lunch, and snack menu available)  
403-762-6141

**Downtown:**

**Magpie and Stump**

Open: 11:30am – 2 am  
203 Caribou Street  
403-762-4067

**Banff Ave Brewing Co.**

Open: 11am – 2 am  
110 Banff Ave, 2<sup>nd</sup> Floor Clocktower Village mall  
403-762-1003

**Park Distillery Restaurant and Bar**

Open: 11am – late  
219 Banff Ave  
403-762-5114  
\*Free Distillery Tours daily at 3:30pm

**Elk & Oarsman**

Open: 11 am – 1 am  
119 Banff Ave  
Second Floor above The Ski Hub  
403-762-4616

**Saltlik a rare steakhouse**

Open: 11:30am – late  
221 Bear Street  
403-762-2467

**The Bear Street Tavern**

Open: 11:30 am – late  
213, 211 Bear Street  
403-762-2021

**The Bison**

Open: 5 pm – late  
213, 211 Bear Street  
Above the Bear Street Tavern  
403-762-5550

**The Maple Leaf Grill & Lounge**

Open: 5 pm - late  
137 Banff Ave

403-760-7680

**Melissa's Missteak - Steak House and Restaurant**

Open: 7am-9:30 pm  
218 Lynx Street  
403-762-5511

**Tooloulou's**

Open: 8 am – 9:30 pm  
204 Caribou Street  
403-762-2633

**Coyotes**

Open: 7:30 am – 10 pm  
206 Caribou Street  
403-762-3963

**St. James's Gate Olde Irish Pub**

Open: 11:30 am – 11:30 pm  
207 Wolf Street  
403-762-9355  
Families welcome until 10 pm

**The Grizzly House**

Open: 11:30 am - midnight  
207 Banff Ave  
403-762-4055

## Shopping

Banff is home to numerous outdoor, souvenir, and high end shops. Ranging from small gift shops along Banff Ave, to high end stores such as Louis Vitton, and Banff institutions such as Monod's Sportswear.

Many of the shops are located along the main street – Banff Ave, but there is also the Cascade Shopping Centre at the corner of Banff Ave and Wolf Street. Several more shops can be found on Bear Street, which runs parallel to Banff Ave, one street to the west.

## Amenities and Attractions

As a premier tourist destination, Banff has many amenities and attractions, including a number of spas and adventure tourism opportunities. Here we have highlighted a few that may be of interest. For more information, please consult the Banff and Lake Louise tourism (<https://www.banfflakelouise.com>).

### **Spas:**

#### **Willow Stream Spa at Fairmont Banff Springs**

<http://www.fairmont.com/banff-springs/willow-stream/>

#### **Pleiades Spa Banff – Banff Upper Hot Springs**

<http://www.hotsprings.ca/pleiades-spa-banff>

### **Attractions:**

#### **Mt. Norquay Via Ferrata and Sightseeing**

<https://summer.banffnorquay.com>

#### **Hydra River Guides**

<http://www.raftbanff.com>

#### **Chinook Rafting**

<http://chinookrafting.com>

#### **Banff Trail Riders**

<https://horseback.com/rides/hourly-rides/>

#### **Brewster Adventures**

<http://www.brewsteradventures.com/summer-trail-rides>

## Hotels and Campgrounds

If you are planning on arriving a few days early or staying a few extra days Banff has many options spanning from very modest (Samesun Hostel) to highly elegant (The RimRock, Banff Springs Hotel). For the best prices, we recommend booking early and checking travel sites such as Expedia.ca.

### **Hotels:**

#### **Samesun Backpacker Lodge**

<http://samesun.com/backpackers-hostels/banff/>

#### **Inns of Banff**

<http://innsofbanff.com>

#### **Best Western Plus Siding Lodge 29**

<http://www.bestwesternsiding29.com>



**Banff Inn**

<http://www.banffinn.com>

**Caribou Lodge & Spa**

<http://banffcariboulodge.com>

**Charlton's Cedar Court**

<http://www.charltonsbانff.com>

**The Rimrock Resort Hotel**

<http://www.rimrockresort.com>

**Fairmont Banff Springs Hotel**

<http://www.fairmont.com/bانff-springs>

**Campgrounds:****Tunnel Mountain**

~10-15 minute drive from downtown Banff on Tunnel Mountain Road

**Two Jack Main or Two Jack Lakeside**

~15-20 minute drive from downtown Banff, on Lake Minnewanka Scenic Drive

**Johnston Canyon**

~30-35 minute drive from downtown Banff on the Bow Valley Parkway

For more information see:

<http://www.pc.gc.ca/eng/pn-np/ab/bانff/activ/camping.aspx>

## Rental Cars

**In Banff:**

Banff has a limited number of rental cars, but for those interested the following companies below offer rentals in Banff:

**Avis Car Rental**

Corner of Wolf Street and Banff Ave

403-762-3222

<https://www.avis.ca>

**Enterprise Rent-A-Car**

521 Banff Ave

403-762-2688

<https://www.enterprise.ca>

**Alamo Rent A Car**

Banff Caribou Lodge & Spa, 521 Banff Ave

1-800-992-8923

<https://www.alamo.com/>

**Hertz Banff Springs Hotel**

405 Spray Ave

403-762-2027

<https://www.hertz.ca>

**Calgary Airport (YYC):**

For those arriving at the Calgary International Airport there are several car rental agencies right at the airport including:

**Avis**

<https://www.avis.ca>

**Budget**

<https://www.budget.ca/en/>

**Dollar Rent A Car**

<https://www.dollar.com>

**Thrifty**

<https://www.thrifty.com>

**Enterprise Rent-A-Car**

<https://www.enterprise.ca>

**Hertz**

<https://www.hertz.ca/>

**National**

<https://www.nationalcar.ca>

**Alamo**

<https://www.alamo.com/>