Interplanetary Weather Bulletin



A solar system forecast

John Parsons

Nelson Literacy Directions

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Interplanetary Weather Bulletin

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INTERPLANETARY Weather Bulletin

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Dear Reader

Most of us are interested in learning what the weather will be like tomorrow. Will it be raining or windy or sunny?

I was watching a weather bulletin on TV when I thought, "I wonder what the weather forecasts will be like in a hundred years?"

> "WE'LL BE CROSSING LIVE TO OUR REPORTERS THROUGHOUT THE SOLAR SYSTEM FOR UPDATES ON WHAT SORT OF A DAY IT'S BEEN IN OUR LITTLE SPOT WITHIN THE ORION ARM OF THE MILKY WAY GALAXY."

If climate change keeps occurring, no doubt the weather in most places on Earth would be very different. But then I also thought that, by that time, we might be reporting the weather from all over the solar system. An interplanetary weather bulletin might go something like this ...

John Parsons

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Contents

INTERPLANETARY Weather Bull

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1 **Welcome to the Interplanetary Weather Bulletin!**

Today's weather updates for every planet in the solar system! page 4

2 **Mercury**

It's hot and sunny, with some surprisingly frosty areas. page 8

3 **Venus**

It's warm enough to evaporate an ocean or two. page 10

4 **Earth**

Some unsettled weather is expected, unless the global climate stops changing. page 13

5 **Mars**

Get ready for dust storms that will need an awful lot of cleaning up after! page 15

6 **Jupiter**

No sign of an end to five hundred years of wild hurricanes. page 18

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7 **Saturn**

Electrical storms, thunder and lightning like you've never seen before.

page 21

8 **Uranus**

Clouds over 29 000 kilometres long make for a dull day.

page 23

9 **Neptune and Pluto**

You guessed it – it's cold. Really, really, *really* cold!

page 26

10 **Global Warming**

Global warming could be the biggest challenge facing humans on their planet – but the future is in your hands.



page 28

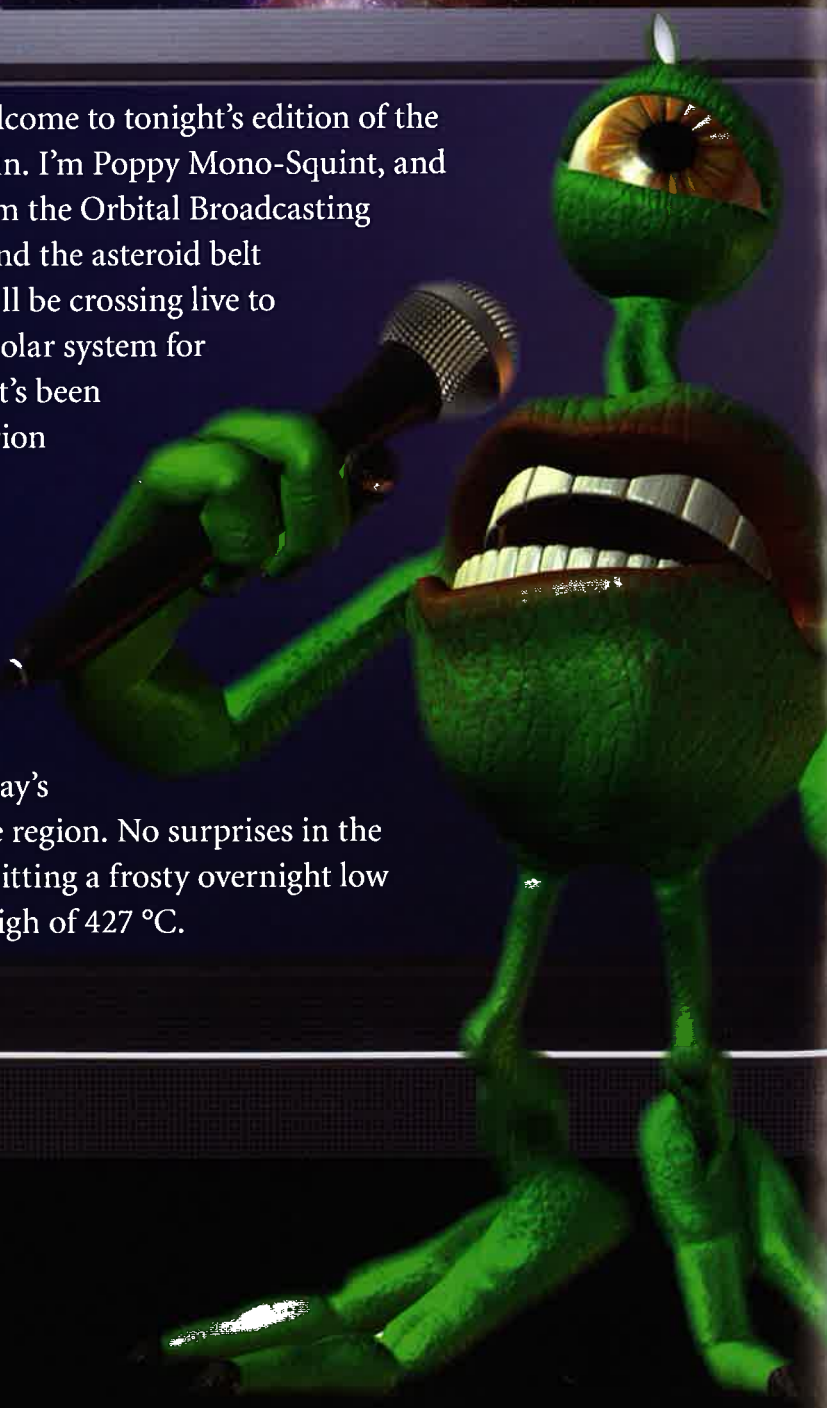
Index and Glossary page 32

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1 Welcome to the Interplanetary Weather Bulletin!

Live Throughout the **Solar System**

Good evening viewers, and welcome to tonight's edition of the Interplanetary Weather Bulletin. I'm Poppy Mono-Squint, and tonight we're broadcasting from the Orbital Broadcasting Corporation's studio just beyond the asteroid belt between Mars and Jupiter. We'll be crossing live to our reporters throughout the solar system for updates on what sort of a day it's been in our little spot within the Orion arm of the Milky Way galaxy. We'll also be taking a look at what the weather's going to look like at your place over the next few days.



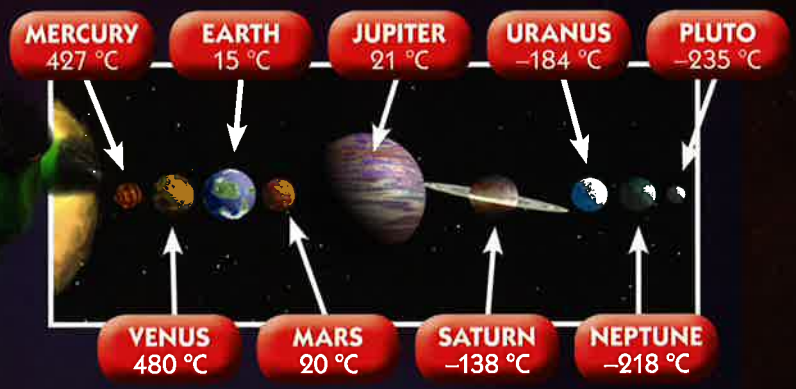
First up, let's take a look at today's highs and lows throughout the region. No surprises in the major centres, with Mercury hitting a frosty overnight low of –183 °C and an afternoon high of 427 °C.

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Venusians have been enjoying a fairly constant 480 °C during their day and night, so let's hope the air conditioning is working or there'll be plenty of tossing and turning for our friends on Venus. Earth's average temperature came in at a pleasant 15 °C, which is a long way from its record high of 57.8 °C and its record low of –89 °C. It's been a lovely day on Mars, with the high at the equator climbing to 20 °C, but wrap up warm, because those temperatures will be dropping to a bracing –90 °C tonight. Those of you swirling around in the upper layers of Jupiter's gas clouds experienced a balmy 21 °C throughout the day, while further out, there was a nippy day on Saturn's surface, with temperatures steady at –138 °C.

If you didn't pack the right clothes for a long summer on Uranus, you'll be feeling those –184 °C days right now, but at –218 °C, the folks on Neptune will be wondering what you're worried about. Meanwhile, beyond the planets, in the remotest provinces, Pluto is experiencing record highs as it comes closer to the Sun than it's been for centuries, with a whopping –235 °C recorded at around lunchtime today.

TODAY'S HIGHS



Well, there are today's highs and lows, now let's see what tomorrow has in store for you. No matter where you are in the solar system, whether the Sun's just another twinkling star or a huge fiery orb in your skies, whether you've been sweltering or shivering, this yellow dwarf is the star that keeps us all together. Let's begin tomorrow's forecast with a look at what's brewing in the centre of our solar system.

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Following some unsettled solar weather patterns, a burst of solar wind was ejected from the Sun yesterday, reaching speeds of up to 500 kilometres per second. When the associated magnetic fields and charged particles hit Earth's atmosphere, there were reports of a colourful aurora in areas around the North Pole. Due to its lack of a magnetic field, exposed areas of Mars can expect to lose some of their scarce atmosphere when the solar wind hits in a couple of days, but, on the bright side, it'll be a good day for getting that washing dry.

Reports from the solar monitoring satellite indicate that solar activity is expected to be low with a chance of some minor disturbances. Surface temperatures on the Sun are expected to be around 5 500 °C, but there's a couple of cooler sunspots holding the mercury down to 4 200 °C in their vicinity, and they're being tracked just in case they join up and cause a solar flare. The geomagnetic field around the Sun is expected to be unsettled to active, with isolated minor storm periods possible and a slight chance for a small proton burst – so if you're travelling between planets tomorrow, make sure you keep your radiation suits handy.

It's time for a break, but don't go away, because right after these commercials, we'll be taking a look at what's in store for Mercury tomorrow.



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This image of the Sun (above) has been taken by cameras that don't capture light, but capture magnetic fields and radiation bursts that are invisible to the human eye. It shows bursts of highly radioactive particles being ejected from the Sun in vast clouds and waves. These travel out into space, and are known as "solar wind".

THE SUN

The Sun is the star at the centre of the solar system. All eight planets (and Pluto, a dwarf planet) move around the Sun in elliptical orbits.



Astronomers classify stars by size and apparent temperature. The hottest stars are blue. Temperatures then cool through white, yellow, orange and red, down to brown, which is the coolest.

The largest stars are called supergiants. Medium-sized stars are known as giants. Small stars are known as dwarfs.

The Sun is a yellow dwarf, which means it is a small star of medium heat. By comparison, blue supergiants may generate more than a million times the Sun's heat!

SUN FACTS

The Sun, which is made up mostly of hydrogen and helium gas, makes up 99.8% of the weight of the entire solar system. All the other planets combined form the other 0.2%. The Sun is like a massive thermonuclear reactor where, in its centre, 620 million tonnes of hydrogen are converted into helium each second!

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2 Mercury

Tempting Temperatures

Welcome back, everybody. Now, let's cross live to our weather reporter on the surface of Mercury, Bob Harrison. I'm guessing you'll be looking for some nice shady spots there, Bob?



INTERPLANETARY WEATHER BULLETIN

MERCURY LIVE!

Thanks, Poppy, and you're right, with another day of temperature swings of up to 610 °C predicted, we won't be venturing too far from home tomorrow! Due to the lack of atmosphere here, there's just no insulation, so when the Sun's beating down on us, it's hot. But there's nothing to hold that heat in. Even though we're the closest planet to that familiar yellow dwarf, when the Sun's not overhead, temperatures on Mercury can drop low enough for the folks at least 2.8 billion kilometres away on Uranus to be comfortable with.

Another consequence of the lack of atmosphere means there's no air or dust to split the Sun's light into different colours, so we won't be seeing any blue skies tomorrow. It'll just be black skies as always, with a huge Sun hovering overhead.

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Actually, when I say tomorrow, I'm just kidding, of course. Mercury rotates so slowly that our "days" are 59 Earth days long. What's even more bizarre is that we orbit the Sun at a faster speed than we rotate. That means that the Sun is actually visible in the sky for 176 days – but after a Mercury noon, it appears to travel backwards for a while.

In terms of the weather forecast on Mercury, it's pretty much more of the same. No atmosphere means no weather, just some wild temperature fluctuations. The only warning we have is for drivers to watch out for ice from comets that have landed on the shady side of craters at the poles. Yes, even on Mercury, there are a few frosty areas. Unlike all the other planets, we don't tilt over on our axis, so there are no seasons and the Sun's always low in the sky at the poles. Even where you might least expect it, you can still find yourself losing control on some slippery ice, so take care out there.

Back to you, Poppy.



Thanks, Bob, sounds like another gloriously hot Mercury day in store for our inner solar-system viewers. Stay right there, folks, we'll be back with the forecast for Venus after this short break.