

What is the closest and furthest distances for Venus from earth?

Thought for 6s

**Closest distance (minimum):** About **38–42 million km** (roughly **0.25–0.28 AU**). [science.nasa.gov](https://science.nasa.gov)

**Furthest distance (maximum):** About **258–261 million km** (roughly **1.73–1.74 AU**). [science.nasa.gov](https://science.nasa.gov)

### Why these numbers?

- **Closest** occurs near **inferior conjunction**, when Venus passes between Earth and the Sun. The exact minimum varies slightly due to the slight eccentricities of both orbits, but it's typically around **39–42 million km**.
- **Furthest** occurs near **superior conjunction**, when Venus is on the opposite side of the Sun from Earth (Earth–Sun–Venus alignment). This reaches about **259–261 million km**.

For context:

- Average distance from Sun to Venus: ~108 million km (0.723 AU).
- Average distance from Sun to Earth: ~150 million km (1 AU).
- The difference (roughly  $1 - 0.723 = 0.277$  AU) explains the minimum; the sum ( $1 + 0.723 \approx 1.723$  AU) explains the maximum.

These extremes happen roughly every 584 days (Venus's synodic period with Earth). Your recent photos of Venus (gibbous phase in late April 2026) were taken when it was relatively far—likely over 100 million km away—showing a nearly full disk because the Sun was illuminating almost the whole side facing us. [en.wikipedia.org](https://en.wikipedia.org)

Venus is Earth's closest planetary neighbor at its minimum distance (even closer than Mars ever gets on average), which is why it can appear so large and bright in a telescope or your P1000 during those close approaches!

Explain Venus-Earth conjunctions

Compare Venus to Mercury distances

So, given those two distances (closest and furthest), why is there not a significant change in visual brightness at these times when viewing with the naked eye OR the Nikon P1000? Wouldn't there be a significant difference in brightness at both times?

Thought for 10s

**Excellent question**—the distance changes by a factor of about **6–7×** (closest ~40 million km vs. furthest ~260 million km), which by the inverse square law alone should make Venus ~36–49× fainter at maximum distance. Yet naked-eye (and camera) brightness stays remarkably steady. Here's why:

### The phase effect perfectly (almost) cancels the distance effect

- **At closest approach** (near inferior conjunction): Venus is a **thin crescent** — only a tiny fraction of its disk is illuminated from our viewpoint. Most of the sunlit side faces away from Earth.

- **At furthest** (near superior conjunction): Venus appears **nearly full/gibbous** — almost 100% illuminated, but it's much farther away.
- **The sweet spot**: Maximum brightness occurs when Venus is a **thick crescent** (around 25–40% illuminated), roughly 35–40 days after greatest elongation (or before). Here, the increasing closeness outweighs the shrinking illuminated portion just enough to peak the total light we receive. [en.wikipedia.org](https://en.wikipedia.org)

This compensation keeps Venus's **apparent magnitude** in a narrow range: roughly **-3.8 to -4.9** over its entire 584-day cycle. That's only about **1.1 magnitude** difference (roughly  $2.7\times$  in brightness), which is noticeable but not dramatic to the naked eye. [astronomy.stackexchange.com](https://astronomy.stackexchange.com)

### Visual brightness range for Venus

- **Brightest** (~ -4.6 to -4.9): Thick crescent phase, ~60–70 million km away.
- **At superior conjunction** (full, furthest): Around -3.8 to -4.0.
- **Your recent photos** (late April 2026, gibbous): Venus is still relatively far and nearly full, so very bright but not at peak.

Here's a good diagram of how phase and size change together:

[earthsky.org](https://earthsky.org)

And a magnitude chart showing the narrow variation:

[jarphys.wordpress.com](https://jarphys.wordpress.com)

## Why your Nikon P1000 doesn't show huge differences

- Cameras (especially with auto-exposure or video) adjust for overall scene brightness.
- Venus is *always* one of the brightest objects in the sky when visible (brighter than any star), so it looks similarly dazzling in photos across much of its cycle.
- Atmospheric shimmer, overexposure, and the planet's tiny angular size further mask subtle changes.

In short, the competing effects of **distance** (inverse square dimming) and **phase** (illuminated fraction) create a remarkable near-cancellation. That's why Venus remains the brilliant "evening star" or "morning star" without wildly fluctuating in brightness from one month to the next. Your observations are spot-on with this behavior!

Explain Venus phases mathematically

Compare Venus brightness to Sirius

OK, so, I've been using the Nikon P100 for several years. I've photographed and videod Venus both as morning stars and as even stars, and yet I've never seen a "crescent" Venus... or any phases... what am I missing?

Thought for 6s

**You're not missing anything major—seeing clear phases of Venus (especially a distinct crescent) with a Nikon P1000 is trickier than many people expect, even after years of trying.** Many P1000 users report the same thing. Here's why it happens and what you can do to finally catch them.

## Why phases are hard to spot with your setup

- **Timing is everything:** Venus spends most of its visibility period as **gibbous** (nearly full, like in your recent photos) or nearly full. The dramatic **crescent phases** only appear for a few weeks around **inferior conjunction** (when Venus passes between Earth and Sun). In 2026, that's around **late September to mid-October** in the evening sky. Before that (now through August), it's mostly gibbous → half. [space.com](#)
- **Low altitude problem:** Crescents occur when Venus is very close to the Sun in the sky (small elongation). It sits low in bright twilight, where:
  - Atmospheric turbulence ("seeing") is worst → shimmering and blurring that hides the phase.
  - The sky is still too bright for easy contrast.
- **Camera challenges with the P1000:**
  - **Auto everything** overexposes Venus badly because it's so bright. The dark portion of the phase gets washed out, making it look like a full shimmering blob.
  - Extreme zoom magnifies turbulence and any slight focus issues.
  - The planet's disk is tiny (10–60 arcseconds), so the phase needs good sharpness to pop. [facebook.com](#)

That's why you've captured the bright "full-ish" views easily as morning/evening star but not the crescents.

## How to finally see/photograph the phases

### 1. Target the right window (2026 evening apparition):

- Greatest elongation: ~August 15 (half phase).
- **Best crescents:** Late August through October (especially September). The disk grows huge while the illuminated part shrinks to a thin, beautiful crescent. It will be low but very large in the frame. [space.com](#)

### 2. Camera settings for Venus phases (critical):

- **Manual mode (M).**
- Full optical zoom (125x or more).
- **Manual focus** — use the focus peaking or magnify the live view. Auto-focus struggles on a small bright dot.
- Short exposure (start with 1/500s or faster, ISO 100) to avoid overexposure. Adjust until you see the dark edge.
- Shoot video (4K) and stack frames later (free tools like AutoStakkert! or PIPP work great).
- Observe/photograph in **twilight** (soon after sunset or before sunrise) when the sky is brighter — this reduces glare and helps show the phase. [facebook.com](#)

### 3. Other tips:

- Steady tripod + remote or timer.
- Try when Venus is higher (earlier in twilight) to reduce turbulence.
- Binoculars or a small telescope make phases obvious, but your P1000 can do it with the right technique.

With those adjustments during the September–October 2026 window, you should finally see that classic crescent Venus in your photos/video — many P1000 owners have captured beautiful ones that way.

[dpreview.com](#)

Your existing shots (gibbous with shimmer) are already great examples of what the camera does well. The phases are there — it's just a matter of catching the right orbital moment with manual control. Let me know when you're shooting in the fall and I can give more specific timing! Keep at it — the payoff is worth it.