

# Ugly Picture Contest

—事例集—

**笑って、楽しんで、学ぼう！**

結晶成長や、プロセスのあと・・・

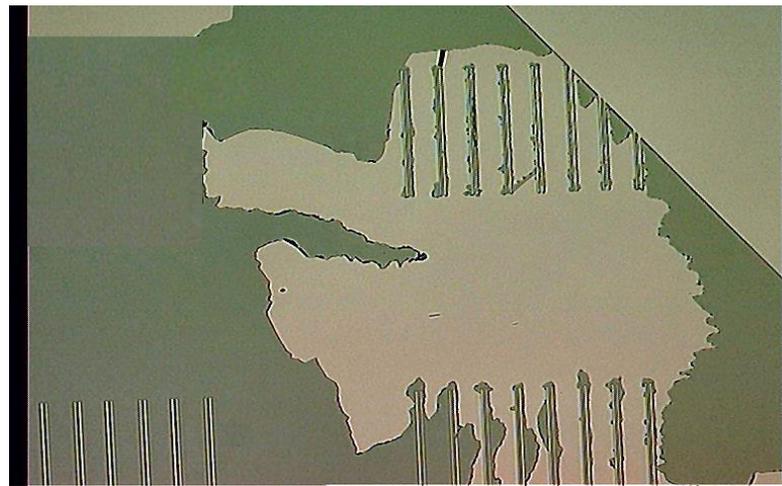
ありゃー、しまった、こりやまずい！と叫んで、お蔵入りしちゃった写真、結構ありませんか？そこには、見た目面白いものがあるでしょう、結構学ぶこともあるかもです。それ、披露しちゃいましょう。

ぶっちゃけ話そうぜ！のEMSならでの新規イベント、応募あれ！  
優秀作品には賞品です！



## Via Monster

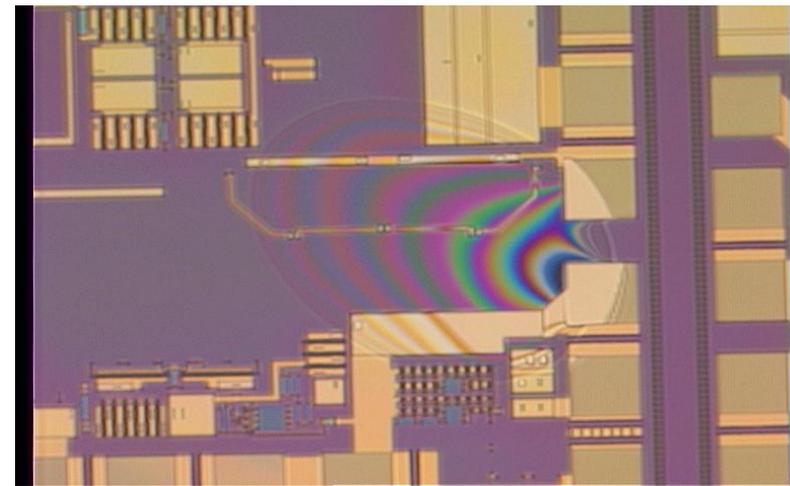
GaAsのVia holeの断面写真。側面がスムーズでなく問題。人（怪物？）の顔に見える。Viaエッチング条件適正化で改善。



## The Big Bad Wolf

This big bad wolf is in Ohmic metal, and if you're not careful, he'll huff, and he'll puff, and he'll blow your yield down!

Really, not so big, 0.5 mm or so. Ohmic metal did not liftoff here. The photoresist was damaged and the metal deposited on GaAs (not likely, the real Ohmics are cleanly delineated) OR the metal did not get swept away when the PR was washed off, and so it plopped down onto the wafer.



## Rainbow Via

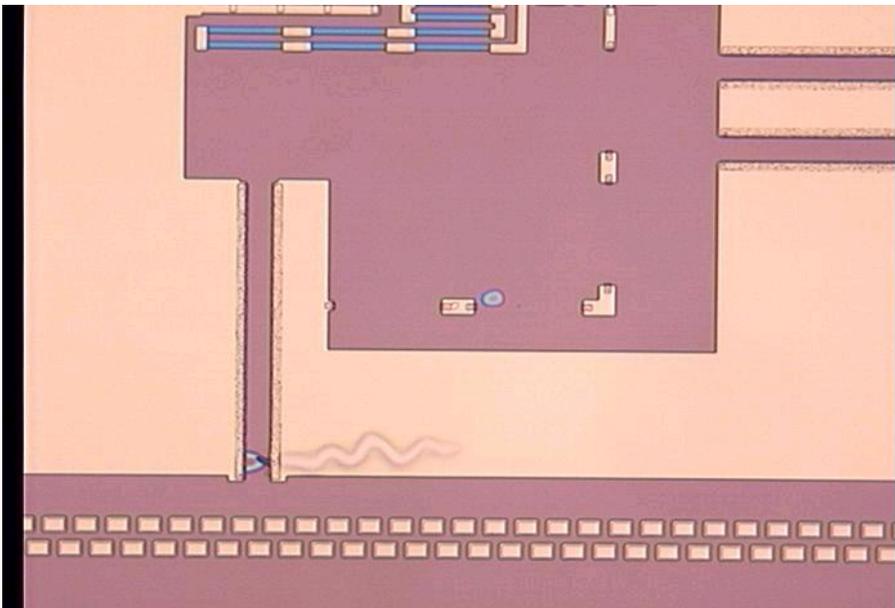
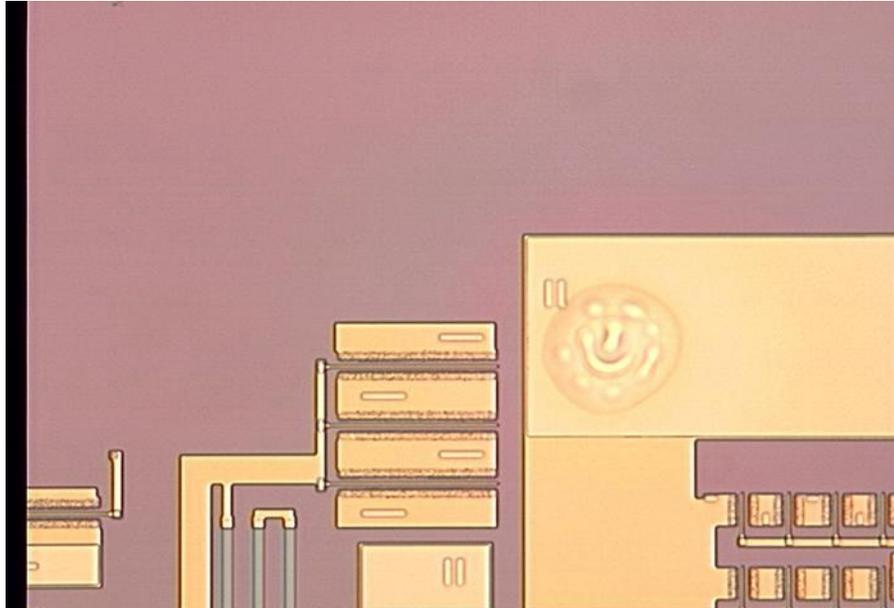
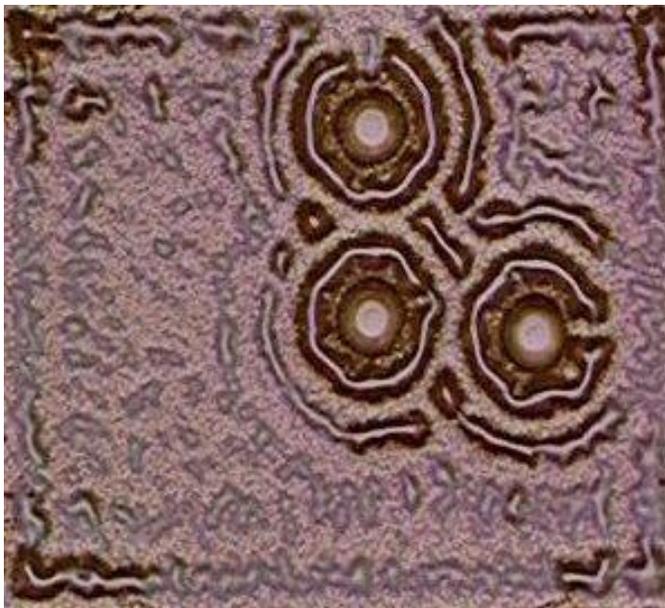
Not the first microsecond of the big bang, but a defect at a via photo step led to this pretty rainbow at a via etch step. The pot of gold at the end of this rainbow is a via!

A photoresist defect of some sort is the most likely source of this effect, uncovering some metal and leading to some wild etching of dielectric in the area. Keep your fab clean and this won't happen.

I tell 'em and tell 'em, but will they listen?

Nooooo. . . .

*Marty Brophy, GaAs ManTech 2002 Ugly Picture Contest*



## Fab Flop or Great Art?

(工場の大失敗? でなきゃ偉大な芸術?)



**The Starry Night**  
**Vincent van Gogh 1889**

We can sometimes produce Art in the course of producing chips. The only problem is that our boss slaps us upside the head for art as in the top figure, whereas collectors pay millions for Art like the bottom figure.

Where is the justice, I ask you?

What we have here is a demonstration of the power of a modern dry etcher, and what it can do to photoresist on an inadequately cooled substrate. Improved wafer mounting and removal of chips from the dry etcher's chuck are two ways this can be fixed at the cost of lost Art (but kept jobs). After all, Art may be Art, but we all have to pay our bills...

## Now they're laughing at us!

This defect on the top plate of a MIM capacitor mocks our efforts to make good product. But how well could he do? And what's so funny, anyway??!

It is a liquid spot on the MIM metal that showed up or popped up under subsequent nitride with funny features. Not a laughing matter to a diligent process engineer! The solution is general improvement in fab practices to avoid splashing.

*Marty Brophy, GaAs ManTech 2002 Ugly Picture Contest*

## Snake in the GaAs, Revisited

There were those who disbelieved the snake in last year's GaAs. But here's the proof - she left her kid behind, something many of us have been tempted to do, especially those who have teenagers.

But I digress. Here is a perfectly innocent Ohmic coldly attacked and about to be bitten by a snake crawling out from under a neighboring Ohmic. Happens all the time, and when is the government going to do something about it? Striving to better, oft we mar what's well, as King Lear said. Vote for me and learn more. This time, I'll try not to make an Asp of myself...

蛇の顔までちゃんとあってfunny!