First Look:
AMD Radeon R9 290

Little Hawaii offers big performance

THIS MONTH, we got to take an in-depth look at AMD's second "Hawaii" GPU, the $400 R9 290. This all-new card slots in right below the company's flagship board, the $550 R9 290X. The only difference between the two cards is that the R9 290 has a lower base clock by a miniscule 53MHz, and has 256 fewer Stream Processors, and that's it. Otherwise the two cards are exactly the same, with both of them rocking the fat Hawaii GPU die, 4GB of memory with a 512-bit memory bus, an 11-inch form factor, TrueAudio and Mantle support, and the company's all-new PowerTune voltage and clock-speed control. These controls allow the card to spin up to a pre-determined temperature that you can tweak in software, then it throttles the clock speeds and voltages on the fly to maintain the appropriate temperature.

Since the R9 290X was designed to take on the GTX Titan, that leaves the R9 290 to scrap with the GTX 780, which Nvidia recently demoted from a $650 card to a $500. With the R9 290 costing less, you could expect it to perform slightly less too, but that is definitely not the case. In testing, we found the R9 290 to run neck-and-neck with the more expensive GTX 780 at 2560x1600. Of our 10-game test suite, the AMD card took top honors in three games, Nvidia won by a razor-thin margin in six others, and the two tied in Crysis 3. These cards are literally eyeball-to-eyeball and worthy adversaries, at least when it comes to performance.

Where these two cards are extremely far apart is in heat and noise, with Nvidia holding a sizeable advantage. AMD has pushed its GCN architecture to the absolute limits on the R9 290(X) GPUs, so when the GPU is under load it will run all the way up to 94 C, which is hotter than any GPU we have ever tested. In AMD's defense, the card was 100 percent stable at this temperature, and didn't heat up components inside the case either, thanks to the GPU's efficient blower-style cooler. But when it reaches its maximum temperature of 94 C, the card begins to throttle, and that affects performance. Cooling and temps are directly related to performance, so the cooler the card is, the longer it can stay at maximum clock speeds, but on both the R9 290 and R9 290X that's not very often. What happens is the card will hit its maximum clock speed of 947MHz as soon as you put a load on it, but once it reaches 94 C it begins to throttle a bit, typically dipping down to 900MHz on average, though it could go as low as 800MHz, but we never saw that in testing. The highly active cooler makes the card noisier than the Nvidia GTX 780, but the noise was never more than just slightly above quiet in our opinion, and is not a deal breaker.

In the end, if you don't mind a teeny bit of noise and heat, the R9 290 offers performance Nvidia simply can't match at this price point. We cannot wait to get some in with third-party coolers on them, to see what improvements can be made in temps, noise, and maybe even a bit of overclocking. **–JN**

The R9 290 is the new title holder in the dollars-per-frames-per-second competition.

ModRight Mod-Mat Xtreme
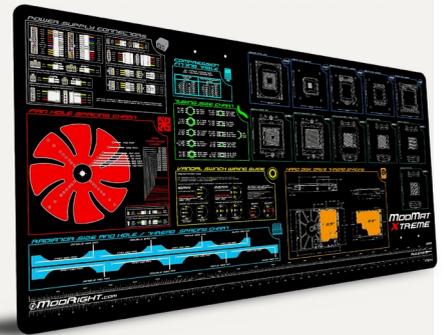
Antistatic mats tend to be pretty utilitarian, but not ModRight's Mod-Mat Xtreme. This slick and informative mat actually serves three roles for builders. First, its thick, rubbery composition safely cushions painted surfaces from marring or scratching. Second, it features two mounting points for grounding straps. Third, rather than a boring black surface, the Mod-Mat Xtreme features useful 1:1 diagrams of commonly referenced information. Examples include which wires are the ground on your 24-pin ATX main power connector, a tubing-size chart, a compression-fitting table, a radiator reference chart, and an integrated ruler. There are also reference illustrations for AMD and Intel CPU sockets, as well as their measurements. We'd like to see diagrams for front-panel and USB/fan-header layouts, but overall, the Mod-Mat Xtreme will make any work surface seem more professional. It's available in two sizes: a 47x23-inch Xtreme size, and a smaller Main-Board version that's 23x23 inches. $40/$60, www.modright.com **–GU**