

A dash of physics thrown into the cocktail mix

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Ever wondered how your martini maintains its crisp and balanced taste, or why a manhattan remains clear if stirred but turns cloudy when shaken?

In this month's edition of [Physics World](#), Naveen Sinha and David Weitz from Harvard University reveal all, describing how some top-end bartenders are ditching trial and error for a more measured, controlled and scientific approach to the art of [cocktail](#) making.

The authors explain how techniques borrowed from physics laboratories – such as rotary evaporators, thermocouples and centrifuges – are increasingly giving these "mixologists" the perfect means to transfer some of their more wacky ideas into the finished products served in bars all over the world.

Among the bartenders adopting the tricks and techniques from physics are Tony Conigliaro of 69 Colebrooke Row in London, John Gertsen at Drink in Boston, and Grant Achatz at Aviary in Chicago.

The rotary evaporator, for instance, can be used to extract the delicate aroma from molecules that would usually be destroyed by the high temperatures used in traditional distillation. It does this by lowering the pressure inside one of its chambers, causing the desired compounds to evaporate and then condense back into a liquid in a separate part of the device.

Sinha and Weitz also highlight the properties of ethanol – the main constituent of cocktails – and explain how these can be exploited to influence the multiple chemical reactions taking place in a cocktail, each affecting the look, feel, taste and smell of that particular mix.

Likewise, the laws of thermodynamics are taken into account to make sure the neat vodka and tequila don't burn the back of your throat on the initial slurp and that the gin and vermouth maintain their crisp, balanced flavours when making a martini.

Weitz, who is a physicist by training, knows a fair amount about the science of cooking as he also runs an undergraduate course at Harvard on the subject that he developed with some of the world's top chefs, including Ferran Adrià of the much-lauded El Bulli restaurant in Catalonia.

"Cocktail recipes have survived and evolved as we have learned to improve the balance of these components," write Sinha and Weitz. "But today's bartenders are seeking inspiration from science to improve these recipes and to invent new concoctions. So let's all raise a glass to science."

Provided by Institute of Physics

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