

## Interview



FUSION CI  
STUDIOS

### In Deep Water with Fusion CI Studios

#### Interview by Fitzy

From dripping taps to stormy seas, fluids have always been one of the toughest CG visual effects to create. Fusion CI Studios have specialized in this area and today work on major motion pictures and TV productions bringing new levels of realism to each project they work on. Our interview today is with Lauren and Mark from Fusion CI Studios, two incredibly nice people whose enthusiasm in their work seems to hold no boundaries.

Mark/Lauren, You both have had such interesting histories can you tell us about your previous work and how you ended forming such a specialist CG visual FX company, Fusion CI Studios?

**Mark:** My previous work involved research on the fluid dynamics of active volcanoes. That had me traveling around the world investigating eruptions. Eventually I got into managing large projects related to disaster prevention and started working to create cg simulations of volcanic eruptions and what that would mean to the people living on the volcanoes I was investigating. It was fascinating stuff for sure, but eventually I found it too limiting on the creative side. When I started focusing on cg sims for the film & television industry, it opened a whole new world for me with tremendous creative opportunities. It made the most sense to focus on the area where I already had really strong expertise and passion: fluid simulation.

**Lauren:** My background is in filmmaking, which is how I met Mark. I was making a film about the Montserrat volcanic eruption in 1996 and Mark was head geo-physicist at the Montserrat Observatory. He remembers me being a huge pain in the ass as I was always wanting to take our cameras into the areas where I'd get the best pictures - the unstable, restricted zones. I ended up making him the main character in my film, so access became less of a problem! ha! About 5 years ago, I started focusing on the development side of the film business and with Mark focusing more on film applications of his fluid fx, we decided to 'fuse' our expertise and talents in Fusion CIS.

Who are your clients?

**Lauren:** We offer service to other visual effects studios -- from tiny boutiques to major studios -- whoever has projects that need advanced fluid effects. Our website lists our clients so far. Many studios find that doing their own fluid effects is still a pain -- it takes a lot of technical expertise, a good eye for the physical behavior, major computational hardware, and significant time. Basically, it eats a lot of resources, which are tough to maintain on a steady basis.

**Mark:** At the same time, fluid effects are getting really common in everything from cartoon-style commercials to games to feature films. Our services let studios rapidly acquire cutting edge fluid effects without fully developing everything from scratch internally. We participate in everything from helping studios bid on projects, to assessing their personnel and hardware needs, to actually doing the work. We also are unique in that, through the project work, we enable studios to handle a level of fluid effects independently if they want to.

Can you tell us a bit about some of the most recent projects?

**Lauren:** Two most recent projects - The Guardian (Touchstone, Sept 29th) working with Flash Film Works in Hollywood and a set of 3 Campbell's Soup commercials, working with Ka-chew! In Hollywood. These were totally different in character. The soup commercials were fun, cartoon-style things involving whacky characters splashing around in soup. There had to be a lot of fluid effects that were cartoony, and yet physically plausible. It was challenging to meet the visual style within the framework of physical simulation, but it worked out very well. We used the opportunity to develop a customized scripting tool for creating cartoon-like splashes, basically a crown splash that you can sculpt in terms of shape and timing. That work was completed in our studio in Santa Monica.



**Mark:** On The Guardian, I supervised a team of 8 artists and worked in-house at Flash Film Works (the lead VFX studio for the film). Working with William Mesa, the vfx supervisor, and Dan Novy, the technical director was a great experience; they are really talented and knowledgeable guys. The fluid fx team's task was to add photorealistic fluid elements to ocean scenes, like whitecaps on the ocean, breaking waves, boat wakes, whatever the VFX supervisor and director dreamed up. Flash Film Works were a great, very experienced group to work with, and despite running a serious R&D program on ocean effects simultaneous with shot production, it was good fun. In the end I completely lost count of the number of elements, as we had success with it they asked for more and more. But everyone was really pleased with the results and I think the high caliber fluid effects really added a great degree of believability to the shots.

Which one has been the most challenging?

**Mark:** I'd say The Guardian. The number of shots, the required quality, and the fact that I had to develop most of the effects from scratch as procedural Python scripts during production, was pretty intense. Not only did the production tools have to work, but they had to be flexible and use-able by non-fluid-dynamics doctorates, and oh by the way we need it yesterday...

Are you ever totally satisfied with the final result?

**Mark:** Never. I always see places for improvement and think a few tweaks or more detail is needed. But if I can make the director happy, I just keep those thoughts to myself. And have a few spare machines churning on improved versions just in case...

For motion pictures how much post production is required, if any?

**Mark:** It really depends on the job and the style of the studio handling the final result. Typically, there's a fair amount of post-production needed in terms of lighting and colour adjustment, to meet the visual goal of the VFX sup. Sometimes people want to render out a final result in one go, but more normally they prefer render passes, with the fluid elements in their own pass and often with different parts of the fluid elements in different passes. For example, on a breaking wave you can have the refractive, dense part of the water, then the spray, then the mist off the spray. The different passes give the comp artists a lot more control and that makes everyone happy.

Have all your projects been for specialist fluid effects?

**Lauren:** Yes, we're a particle effects studio. We've primarily focused on water (or beer!) and spray, and foam and mist. We focus on cutting edge, challenging stuff, always pushing the technology forward. We're currently in an intensive R&D period to improve RealFlow 4's fire and smoke capabilities. We've had some great initial tests, so we're very optimistic this is going to be a great break-through very soon!

How did the strategic alliance with Next Limit Technologies, developers of RealFlow come about?

**Lauren:** In Mark's academic research days, he started using RealFlow because he needed a solid, flexible fluid simulation tool for volcanic eruption sims. He had written his own basic fluid solvers during his PhD work (a nightmare!) and, it wasn't something he wanted to re-invent if he didn't have to. So he started using RealFlow and felt it was the best fluid solution option. He developed a strong technical relationship with Next Limit, helping them beta test and bouncing methodology and simulation engine ideas around. The relationship just grew steadily as Mark became more experienced with RF, and with using it in production.



**Mark:** Eventually, we decided that the best way to really push the technology and get spectacular results was to work together closely, with Fusion CIS spearheading

production work and bringing the newest versions of RealFlow into a production environment. Next Limit gave us special engineering support on the projects we were working on to facilitate efficiency of production. It has worked brilliantly and we're currently strengthening the relationship even more, with some really great projects on the horizon.

What do you think users will think of the latest version of RealFlow?

**Mark:** I keep in close touch with a lot of users in studios, and also freelancers, so I know what they're saying about it and they think it's hugely improved, far more powerful, and much better to use. It just feels like a professional 3D app now. And, it crashes far less! If you've ever tried writing your own physical simulation software, you'll know how tough it is to achieve stability.

What do you think has been the biggest improvement in this version?

**Mark:** I always answer Python scripting capabilities and the GUI. I can't really put one above the other. Scripting allows you to do almost all the things you imagined previously, but couldn't do. It is totally amazing what can be done, and done easily. On the other hand, scripting is a pretty technical side of working in 3D so won't be everyone's cup of tea. The GUI, however, is hugely improved and absolutely everyone will feel that immediately. Being able to customize layouts and work more efficiently with all the most basic work is a big relief.

Are you already helping to develop/working on version 5?

**Mark:** Absolutely. We've been discussing the features of RF5 for months and essentially started active work on it at SIGGRAPH in Boston.

What do you think will be the next challenge for this very specialist visual FX area?

**Mark:** The issue of scale -- or essentially, level of detail. Currently, you have to work really hard and do some clever things to achieve a highly photo-real look. But if you imagine a big breaking wave and think about all the detail represented by the complex surface of the shattering fluid, and the many millions of variously-sized droplets that our eyes perceive, it's no surprise it is difficult to achieve this. On top of just achieving the detail of geometry, you have to achieve the detail of simulated behavior that again our eyes are amazingly good at seeing. Watch for developments there.

What does the future hold for Fusion CI Studios?

**Mark:** We've shifted from working primarily in-house at vfx studios, to providing studios with fluid assets for feature films or commercials. We can be more efficient with R&D and simulations, and can largely remove from a studio's plate the big overhead of fluid effects. A lot of studios are liking this. It also keeps us at the cutting edge of this rapidly evolving, technically challenging area, something most studios will have a hard time doing without big overhead costs. We'll maintain the attitude of helping studios get set up to handle the basics of fluids themselves, but we'll do more of the really advanced & challenging stuff in-house. That way we also maintain a core body of proprietary methods that builds the value of our services.



**Lauren:** We have also expanded our team and infrastructure (with a studio in LA and in Vancouver) to handle a number of scenarios. We're having fun providing a service that a lot of studios are looking for right now, so we try to be as accommodating as we can despite juggling a number of projects at any one time.

The other thing that I'm really excited about is the potential of what we can accomplish with RealFlow. This is off-the-shelf software, affordable and accessible to any competent vfx studio. With Fusion's R&D & scripting contributions and the outstanding efforts of the Next Limit engineering team, this software has become a high-end professional tool used successfully for hero effects in feature films. Until now only the larger leading-edge studios have been able to bid on major fluid FX shots as they've been able to afford to spend months and months, maybe years, developing their own in-house proprietary fluid solution. Now RealFlow is leveling the playing field.

Fusion CI Studios  
310 928-1483 Los Angeles  
604 908-5577 Vancouver

[www.fusioncis.com](http://www.fusioncis.com)  
[info@fusioncis.com](mailto:info@fusioncis.com)

<http://www.realflow.com/>

Photographs may not be reproduced without permission, copyright Disney 2006

Copyright 2006, PlanIt 3D

Copyright © 2000-2006 planit3d.com . All rights reserved.