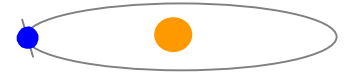




The Fluid Optics™ letter

La lettre des Syzygies



1999, December

EDITORIAL

We are happy to present you the winter solstice edition of the Syzygies letter.

This letter is made up of three articles.

The first shows a new type of street lamp-posts where the light sources are at the bottom of the mast. They make the maintenance costs decreased.

The second article theme has been asked by one of our subscribers. It is a short study about the traditional reflector efficiency according to the angle of the input light.

The third one presents a new idea of interior lighting. It is entirely transparent and its light source is at its foot.

We thank you for your loyalty during the year 1999 and we wish you a happy new year 2000.

Fluid Optics' inventors

CONCEPT

THE NEW STREET LAMP-POST Editorial FLUID OPTICS™

Today, the fundamental problem of public street lamp-post is the maintenance of their optics and their sources. Indeed, periodically, it is necessary to change the light source and to clean the optic placed in head of mast. This is accomplished by using a work platform truck that obstruct sometimes public highway traffic. This maintenance, is expansive.

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SOFTWARES

REFLECTOR SIMULATION

In accordance of one of our subscribers you will find in this article a little study of traditionnal reflectors. The elementary pattern is the corner of a cube.

In opposition to preconceived ideas, reflectors are not perfect and require a very high level of artwork.

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SUMMARY

Concept

**The new street lamp-post
Fluid Optics**

Softwares

Reflector simulation

Ideas

A fully transparent lighting

**The small news of the
causorium**

Ecran 2000

News

**THE SMALL NEWS OF
THE CAUSORIUM**

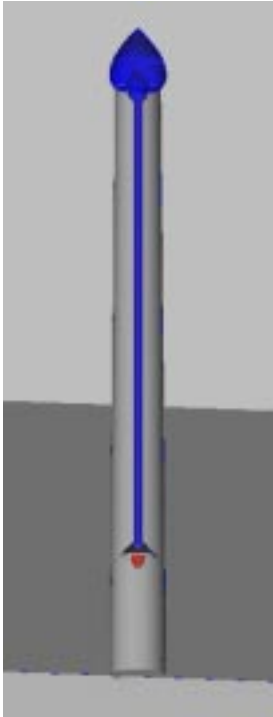
ECRAN 2000

Crue dilemma on the projector of great power ECRAN2000 destined to project pictures on clouds.

In collaboration with Mister Félicien CARLI, an architect, our company presented to the Mission Paris 2000, early 1999, the projec-

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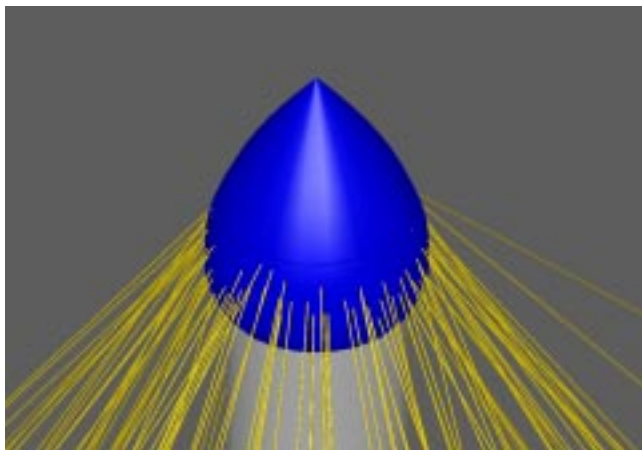
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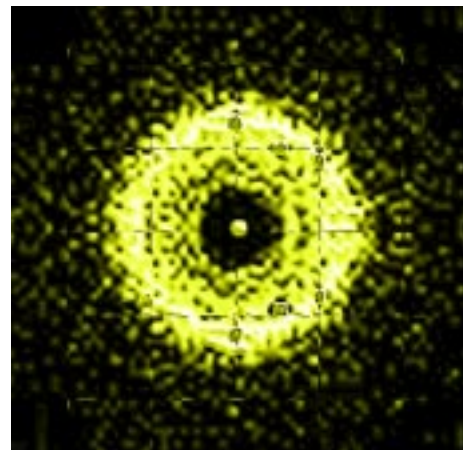
view of the optical system

The new street lamp-post FLUID OPTICS is made by one or several sources at the bottom of the mast, a reflector to concentrate the light, an optic guide (PMMA for instance), an optic with a drop shape at the top. The different sources can be controlled according to the meteorology. This form of drop has been chosen to be naturally cleaned by rain without other maintenance. The useful part of the street lamp post is entirely in fully transparent plastic matter without reflecting deposit. A metallic tube can be used in order to protect the street lamp post.

With powerful light sources, in the state of art, a PMMA optic guide cannot be used. In this case, we can use a dynamic Fluid Optics system to eliminate infrared energy. This system allow the use of plastic light pipes which are fragile to calorific effects.



Detailed view of the drop sending light to the ground



Map of the illumination of the ground

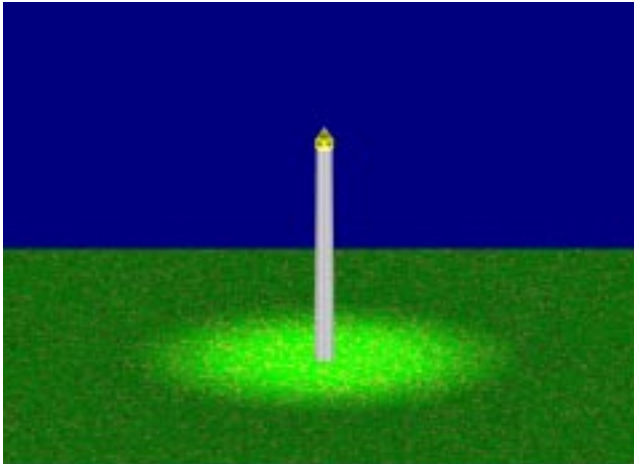
Nights and days, this kind of street lamp-post fit well with the environment

- Off, it is entirely transparent.
- On, the drop in PMMA sends to the ground, a circular light trace that surrounds the foot of the street lamp post, or that it is contiguous.

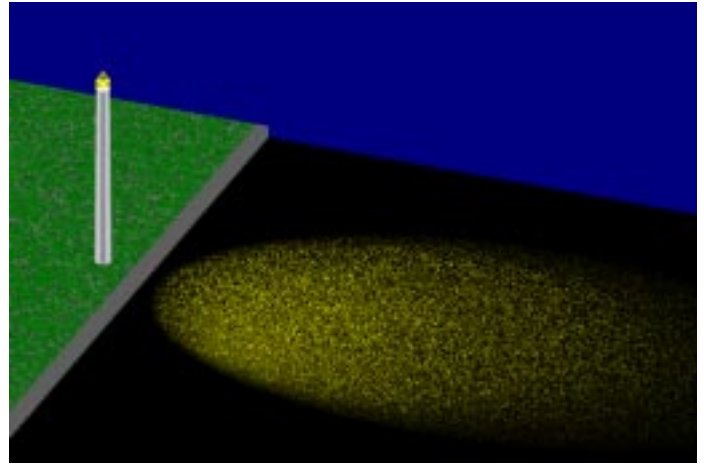
To avoid the light pollution, the Fluid Optics street lamp post is studied to not emit any light except where it has to. The spot on the ground can be circular, elliptic, rectangular, etc... All shapes of light spots are possible.

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Synthetic image of a garden lamp-post



Synthetic image of a street lamp-post with a side lighting for pedestrian crossing.

For a garden use, the light spot on the ground can be circular and centred. For a street use, the light spot can be deported on a side.

A smaller version of the street lamp-post had been designed to be at the root of a new product range of desk lamps, reading lamps and domestic lighting with various functions. The Fluid Optics technology is well suited to a large range of application in the domestic lightning scope. It's also possible to obtain a unique output light beam, or several ones, from the Fluid Optics street lamp-post.

Benefits of the Fluid Optics™ street lamp-post is its reduced maintenance. As the light source is located at the bottom of the mast, it can be replaced easily by the public maintenance services, without obstructing an entire highway, nor using an aerial work platform. The cleaning of the optical part becomes useless as it had been designed to be cleaned by the rain. Last but not least, the Fluid Optics street lamp post doesn't cause any light pollution.

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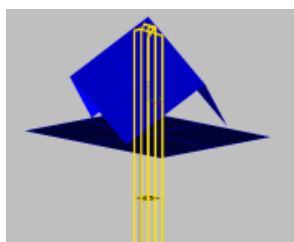
We will start by studying an elementary pattern lighted up by a parallel source, under a null angle of incidence. We will carry on with a set of elementary patterns lighted up by the same parallel source, under higher and higher angles of incidence. Then we will conclude with a graph representing the efficiency of the reflected beam function of the variation of the angle of incidence.

We assume that these reflectors are made in PMMA materials.

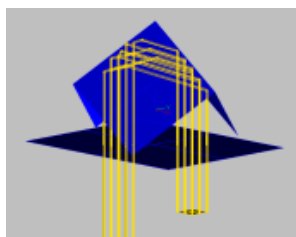
We enlighten the corner of a cube, under a null incidence. We check that no leak of light is possible.

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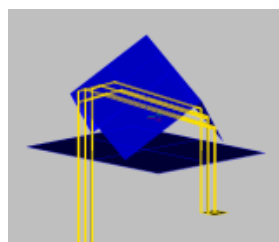
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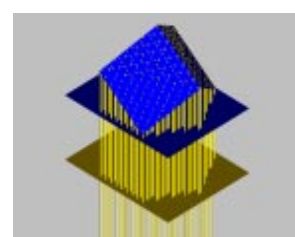
Case n°1



Case n°2



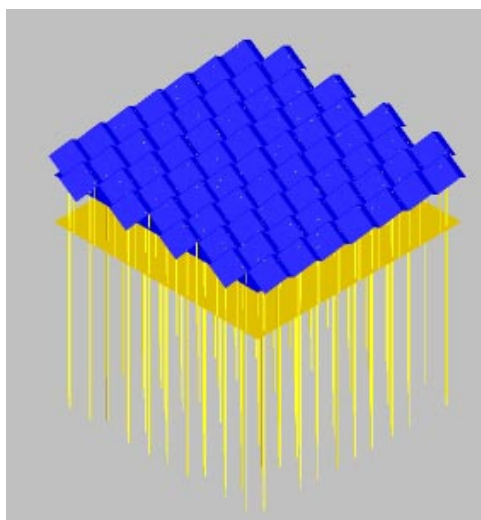
Case n°3



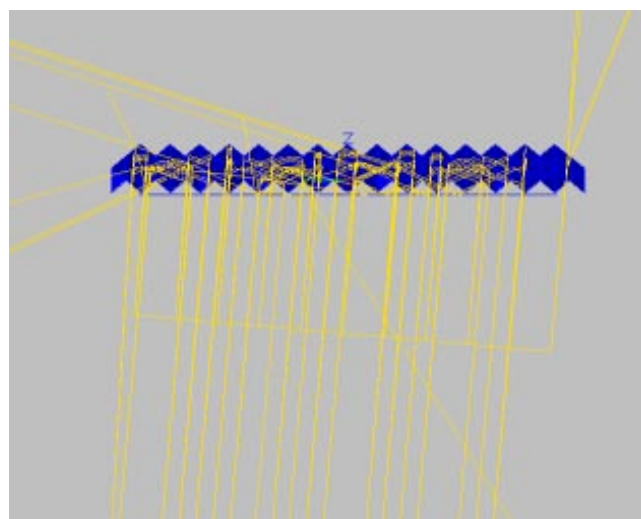
Case n°4

In all the displayed cases, all of the light reaching the reflector is sent back.

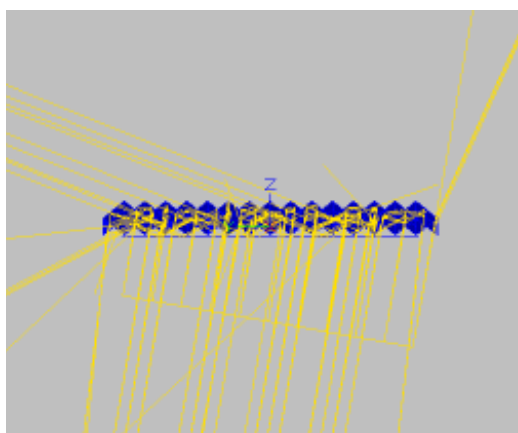
Let's build now a whole reflector made of several identical elementary patterns.



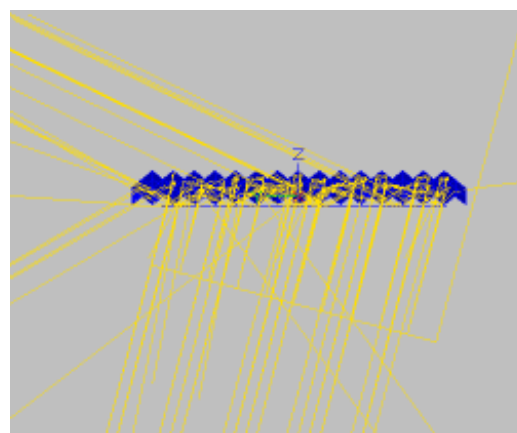
Case n°1- null incidence



Case n°2 - incidence = 5 °



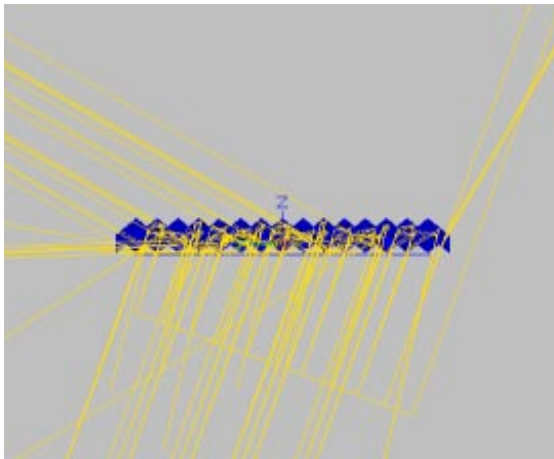
Case n°3 - incidence = 10 °



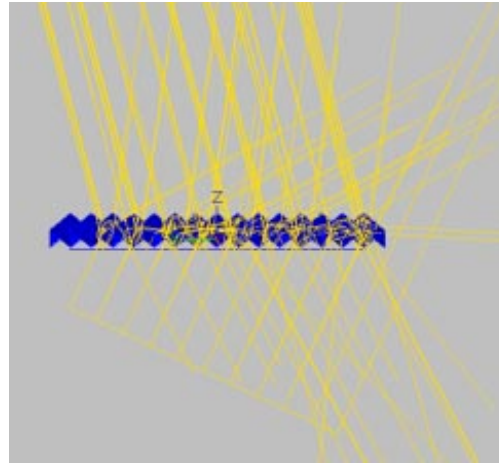
Case n°4- incidence = 15 °

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Case n°5 - incidence = 20 °



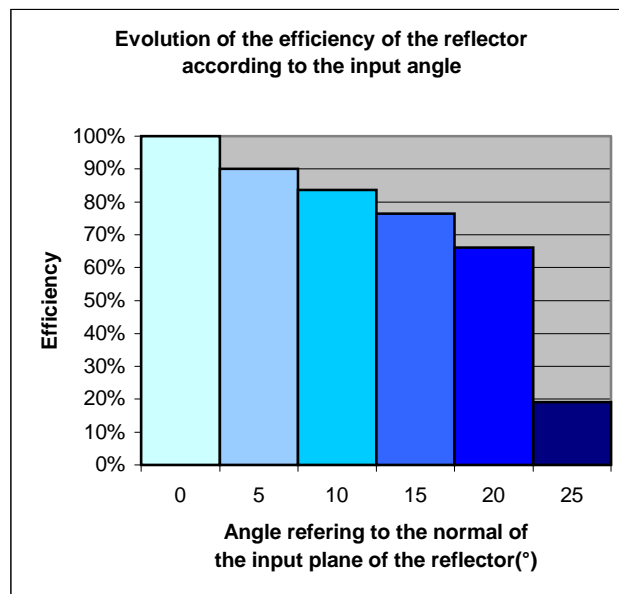
Case n°6 - incidence = 25 °

In the first case, we check, with an incidence equal zero, that the reflected back light beams are collinear to the incident beams and the loss is null on the whole reflector.

In all the other cases, with an incidence different from zero, losses appear.

From case N°2, where the incidence as compared to the normal of the face of entry is 5°, non-reflected light beams are lost by the edge or the back of the reflector.

We notice a deterioration for case studies N° 3, 4, 5 and 6, where the incidence is even higher and respectively equal 10°, 15°, 20° and 25°. In each case we can calculate the efficiency of the reflector as being the ratio between the number of reflected light beams and the number of light beams entering the reflector by refraction through the flat input face.



Graph of the theoretical efficiency of a traditional reflector according to the incident angle of initial rays.

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We notice after 25° of initial incidence angle, that the traditional reflector loses a lot of its efficiency. For memory, these results are only theoretical, and the reflectors, once built, shall have a lower efficiency than the one calculated.

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for ECRAN2000 with a 50 000 Watt designed power for the Y2K celebrations.

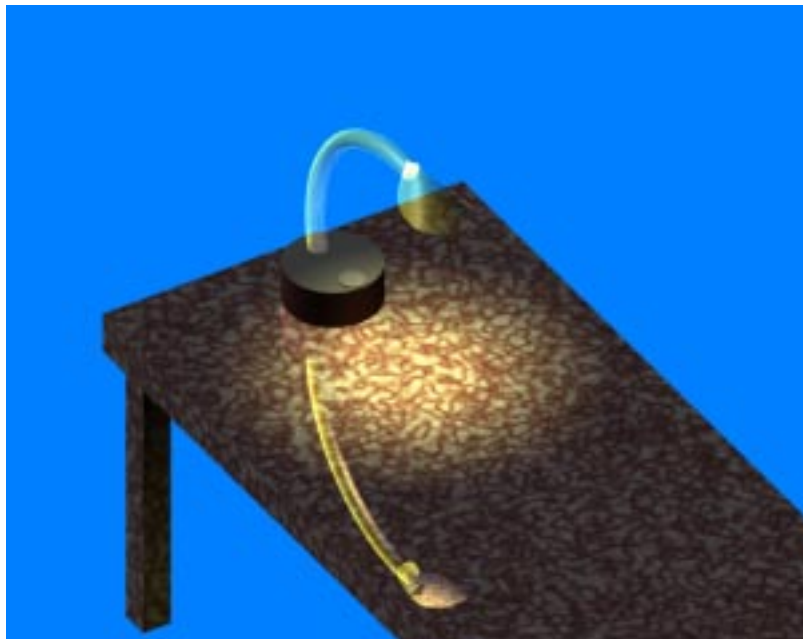
The Mission Paris 2000 answered it cannot subsidize such a project, and we understand this position. We found sponsors, but the mission agreement was required because the subsidy can only be presented by this Mission Paris 2000.

Up to now, despite several recalls, we still don't have any answer from the Mission Paris 2000 regarding the agreement or rejection of this project. Furthermore, according to "Le Parisien" (23-11-99), a French newspaper, the General Commissioner of the Mission Paris 2000 said, "that the heads of the Mission Paris 2000 find the Paris people a little fearful for proposing innovative ideas". Whose message shall we listen to? If this "première" unfortunately does not happen in Paris, it may happen abroad. It is quite a pity!

IDEAS

A FULLY TRANSPARENT LIGHTING

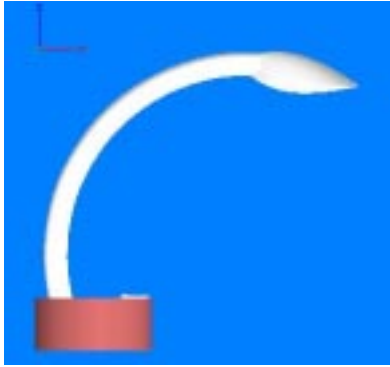
The same principle of duct combinations completely transparent in PMMA plastic presented in the chapter "concept", can be used for creating any type of lighting systems like lamps for desk, table, chimney, lighting in a specific or any directions.



View in perspective showing a desk lamp whose optic is in transparent plastic.

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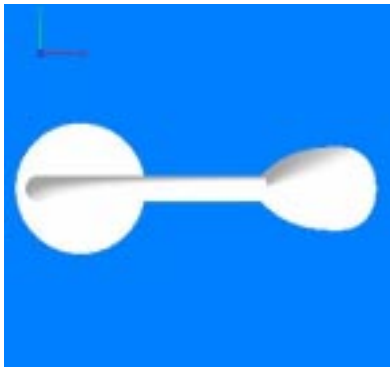
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profile view



face view



top view



perspective view

The presented lamp-post can also be dedicated to inside lighting like living rooms lighting or wall brackets directing their light beam in any wanted directions.

NEWS

LAW

We are pleased to inform you the OPTIQUE FLUIDE is now a registered trademark.

ATTENTION !

The web site address of the Fluid Optics' Inventors has changed. The Fluid Optics owns since August 1999 its dedicated domain name "OPTIQUE-FLUIDE" on Internet:

<http://www.optique-fluide.org>

If there is a topic you want to be developed in this letter, please contact us directly at the following Email address :

syzygies@optique-fluide.org

You can also contact

MEGALUX,

The company in charge of exploiting the Fluid Optics, at the following address:

info@megalux.com

PROCHAINE LETTRE

Our next letter will be the first of the 2000 year. The next letter of the Syzygies will be edited for the spring equinox, mid of March.

BEST WISHES

Here it is ! We wish you a happy New Year 2000 to you and your nearest and dearest.